ARE WOMEN UNDERPAID ?

: the findings of the magnitude estimation of occupational utility.

A thesis

submitted in partial fulfilment

of the requirements for the Degree

of

Master of Arts in Psychology

in the

University of Canterbury

by

Tracey C.M. Bond

University of Canterbury

1990

ACKNOWLODGEMENTS

I wish to thank my supervisor, Dr Simon Kemp, for his advice, direction and good humour over the course of this research. I also wish to express my gratitude for the unconditional support given by my parents, and to thank my father for proof reading the final draft. Finally, I am thankful to Glenn Purdon who reduced my stress levels with his personal support and empathy.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Magnitude estimation was used by 160 respondents from the general public, 83 male and 77 female, to estimate the utility (value) to society of 26 female-dominant, 26 male-dominant, and 6 neutral occupations. Respondents were randomly assigned to complete one of two forms of the questionnaire - with or without job descriptions. The logged median estimated values obtained were plotted against the logged median incomes for the occupations and the ensuing power function was used to predict the value of occupations from the income. 12 male-dominant and 10 female-dominant occupations were found to be underpaid according to their societal value as estimated by the respondents. It was found that the median income accounted for a substantial proportion of the variance in estimated values attributed to variance in income, with the sex of the respondent, the sex dominance of the occupation, and the form of questionnaire, having little effect. There was a high degree of similarity among respondents in the valuation of occupations, leading to the conclusion that some female-dominant occupations are underpaid, just as much as some male-dominant occupations are underpaid relative to their value to society. Thus inequitable pay is not solely discrimination against women. Future research should focus on why women are concentrated in occupations that are not valued highly by society, and how this could be remedied.

CHAPTER ONE

INTRODUCTION

Finding a meaningful way to compare occupations has been an important issue for those concerned with pay equity, otherwise known as comparable worth. To determine the comparable worth, jobs which are similar in components such as skill, responsibility and training, are compared. In many cases it has been found that jobs that are comparable in these components are actually paid differently. Lower paying jobs tend to be held by women, and this wage gap is often attributed to historical factors and the segregation of women into lower status jobs (Hyman,1987). The most commonly used method to compare jobs is job evaluation whose objective is to rank the jobs in an organisation according to the value or worth to the employer (Burns,1989) - a technique that has been widely criticised.

This research investigates applying the technique of magnitude estimation to measure the utility (value) of occupations. The method is different from that normally used in comparing occupations in that it stresses utility to society and does not compare job components. Instead, respondents numerically assess what they believe to be the value of each occupation to society. The relationship between the values given to the occupations and their salaries can be described by a power function. By using the power function, occupations can be compared as to whether or not they are under, or over-paid, according to their overall value.

In chapter two, the measurement of utility is briefly reviewed, as are the background and current applications of magnitude estimation. The issues involved in comparing the values of occupations are also briefly presented, and in the final section, the rationale for this study is outlined. Chapter three describes the method of the research and chapter four presents the results. In chapter five these results are discussed in general and the usefulness of the technique of magnitude estimation for the valuing and comparing of occupations is assessed. The limitations of the present study are discussed along with possible improvements that could be made and how the study of the value of occupations might be further developed. The final section of chapter five summarises the findings of this study.

CHAPTER TWO

LITERATURE REVIEW

2.1 THE MEASUREMENT OF UTILITY

Utility is studied in economics as an examination of individual behaviour. Individuals show preferences for different alternatives and can rank them according to their relative desirabilities, where the more desirable alternatives offer more utility than less desirable ones. This is the basic concept of utility (Nicholson, 1985).

Utility is also a term used for overall satisfaction. It is difficult to measure, as overall satisfaction is affected by factors other than desired outcome. Examples of these factors are such things as personal experiences, peer pressure, cultural values; therefore different individuals will not have exactly the same utilities for certain outcomes. Economic theory assumes that people will behave in a way that maximises utility. This involves choice between alternatives. The main focus of economic theory of utility addresses how individuals behave in the pursuit of maximum utility, and this involves the measurement of utility.

Mosteller and Nogee (1951) pose the important question of whether or not utility can actually be measured. They suspect that individuals have a subjective value of commodities that is not just a translation of the

objective value. This implies, for example, that the actual value of a commodity to an individual may not be reflected in its price.

The study of utility in economics, and psychology, may help in understanding the decision- making processes of individuals, and utility analysis may be able to provide justifications for choosing certain alternatives over others. To this end, utility analysis has been applied to practical problems.

For example, in organisational psychology, utility analysis has been applied to measure the worth of different personnel practices such as the use of application blanks in the selection of employees (Lee and Booth, 1974), determination of the utility of assessment centres in the selection of employees (Cascio and Silbey, 1979), the utility of the outcomes from decisions (Pitz, Heerboth and Sachs, 1980), and the worth of performance measurement and feedback (Landy, Farr, and Jacobs, 1982). These analyses are used to measure the increase in utility resulting from a personnel program. This is a form of cost- benefit analysis, which is a more common use of utility, and one in which the expected benefit of a program, the actual benefits observed, and the overall costs involved, are calculated by the use of a utility formula.

Utility analysis in organisational psychology is described by Cascio and Silby as the "determination of expected institutional gain or loss anticipated to result from various courses of action." (1979, p 108). Landy et al (1982) suggests that utility analysis can thus provide a tangible interpretation of personnel practices, (which has been lacking in the past), as it can provide a dollar cost of the program to employers. In this respect, it seems likely,

according to Boudreau (1983), that utility analysis and estimation will feature more in organisational psychology research and practice.

2.2 MAGNITUDE ESTIMATION

The technique of magnitude estimation has been applied to the measurement of utility. This technique does not rely on a formula but rather is a direct approach which, as Stevens (1959) states, is based on the assumption that individuals can assess the ratio of subjective values of different items. The method of magnitude estimation involves a participant giving a numerical estimate to the relative magnitude of the stimulus. The technique originated in psychophysics where it was developed to measure subjective dimensions such as loudness and brightness (Stevens, 1974).

The psychophysical law that relates to magnitude estimation has the basic principle that equal stimulus ratios produce equal sensation ratios. The ensuing psychophysical law is a power function. (Stevens, 1957).

The formula for this is :

$$\Psi = k \phi^n$$

where:

Ψ is the subjective magnitude of the stimulus

ϕ is the objectively measured magnitude of the stimulus.

k is the constant and

n the exponent. (Stevens, 1975)

It is widely believed that the power function properly describes the relationship between the response magnitude values and the stimulus magnitude values (Coleman, Graf and Alf, 1981). Numerous experiments

in a variety of sense modalities have been conducted to demonstrate this. Hamblin (1974, pp 66-67) summarises findings indicating that the power law describes the average individual's responses.

Stevens (1959) identifies one of the main difficulties with magnitude estimation as being human variability. There is variability in individual exponents and Stevens suggests that attempts should be made to describe the typical response of the median observer, and from there to analyse individual differences, instead of trying to explain the experience of each individual. Teghtsoonian and Teghtsoonian (1971) state that there is a great amount of evidence that the power law describes individual subjects' data, as well as the group average. They found that 90% of variance in individual exponents is due to chance, if the interval between sessions is greater than 24 hours. This finding suggests the exponent of the group data is actually a good description of individual subjects' exponents and that apparent individual differences are due to error. Contrary to this, Cross (1982) suggests that individuals tend to assign numerical estimates differently, thus the group data will not describe individual estimates very well. However, the relative magnitude of the individual perceptions should be compared as magnitude judgements are not measurements of actual sensations or perceptions, but rather, indications of the individual's experiences of the stimuli.

Magnitude estimation has been used effectively in social psychology to measure attitudes and opinions. Hamblin (1974, p 113) summarizes data from 15 bivariate experiments on social attitude phenomena. A power function was found for each describing the relationship between the magnitude of the attitude and the magnitude of the related social stimulus for each. Thus, magnitude estimation appears to be a useful technique to

indicate individual's experiences of social as well as sensory and perceptual phenomena.

As an example, Coleman and Rainwater (1978) report an experiment using magnitude estimation to estimate social status. Respondents were required to estimate the status of a family, given a 3- factor profile. An example is "The Jonses - he is an electrician who earns $ 10,000 a year and has an eighth- grade education" (pp 211). The family is assigned 100 units and used as the standard from which estimates of the relative social standing for families with different profiles are made. Regression analysis resulted in income with an exponent of 0.54, the job 0.27, and education 0.18. Thus, Coleman and Rainwater approximate that income level accounts for almost two-thirds of the variation in general social standing, with occupation and education level evenly accounting for the remainder. They conclude that income has an overwhelming importance in how social standing is perceived. Stevens (1974) reports power exponents relating status to income being close to 0.6 or 0.7. Thus, as income increases, so does status, but not to the same degree. The consensus in respondents status estimations indicates that a 100 percent increase in income would result in a 50 - 60 percent increase in status, thus diminishing marginal utility. Marginal utility is the extra utility that an individual receives by obtaining one more unit of an item (Nicholson, 1985).

As a measurement of utility, magnitude estimation was applied by Galanter (1962, p 211) to assess the utility of money in terms of the "valuational effect that the receipt of money produces". So that people would not scale the actual amounts of money, they were asked to estimate the "happiness that money brings" by thinking about how much money they would want in order to feel twice as happy as, for instance, $10.00, would make them feel. He found the relationship between money and

utility showed diminishing marginal utility and was described by a power function with an exponent of 0.43. This supports Stevens (1959) statement that the exponent of the power function will be less than 1.0, if marginal utility does in fact diminish with increasing monetary value.

Kemp (1988) investigated whether the utility of personally and nationally consumed goods and services could be measured using the magnitude estimation technique, and if Stevens' power law described the relation between utility and cost. Participants were required to estimate the usefulness or desirability of two lists of items, personal and national, relative to a given standard of either 10 or 100 units. Personal items were items such as a new car, that were expected to be rated as having a positive value to the respondent. National items were policies that were carried out by the government, or that had been suggested to the government.

Student and general public samples were used, and similar results reported for the two samples and the two standards. For the personal items, the power law exponents ranged from 0.33 - 0.46 with correlations between logged estimates and logged costs of 0.94 or 0.95. The fact that the results were consistent across the two standards indicates that the method of magnitude estimation was used appropriately by respondents. The power function was found to be a good description of the relationship between the estimates and the actual cost of items, as is suggested by the high correlations.

No relationship was found between the estimated utility and cost for the national items. For those personal items that were uncosted, for example fine weather next weekend, the power function obtained from the other items could be used to provide equivalent costs, thus, as Kemp pointed out, providing a practical application of the power function.

Kemp (1989) investigated whether the method of magnitude estimation was useful in measuring the utility of public goods and services. In study one, there were four conditions : control, cost, allotment and loss. Respondents rated the items in one of these conditions relative to the standard given. For the control condition, respondents were required to assess the utility of each item that was being carried out by the West German government at the time. The same task was required for those assigned to the cost condition, however the cost of each item was also presented. Respondents in the allotment condition were asked to estimate how much money they feel the government should provide for each item. For the loss condition, respondents were to estimate the loss to the general public if the item was withdrawn. Power law exponents were obtained ranging from .14 - .26 for the four experimental groups, with correlations from the regressing of the logged utility estimates on the logged actual costs of the goods and services ranging from .27 - .52. Stevens' power law was not found to describe the relationship between the cost and utility of the items very well. This may be explained by the fact that variables other than cost affect utility. This is supported by study two and three. Study two required respondents to attempt both magnitude estimation and category scaling of the utility of the same set of public items. The magnitude estimation task was the same as in study one. The category scaling instructions required respondents to rate each item on a scale of zero (no value) to ten (highest value). The respondents were also asked to rate which technique they preferred. A correlation of .97 was obtained between the two measures when the mean category scale values were plotted against the logged median magnitude estimation. This suggests that the two measures both provide a valid way of measuring utility. In study three Kemp investigated whether the same power function that relates the utility of public items to their costs, also relates the utility of private items to their price. The study also assesses

whether the utilities of private and public items are similar. Respondents estimated the utilities of 13 private and 15 public items relative to the same standard, which was an inheritance of DM 5,000 with the given utility of 100 units. The items used are the same as in study one, with two exceptions. Similar results to study one were found in study three on the public items with a correlation of .95 for the general public sample and .97 for the student sample. However the correlations were lower for the private items, being .84 for the general public sample and .80 for the student sample. The overall results led Kemp to conclude that there is a construct of utility of public goods, and that this can be measured using magnitude estimation.

2.3 THE VALUE OF OCCUPATIONS

A possible application of magnitude estimation as a measure of utility is in the determining the utility (value) of occupations. No studies, to this author's knowledge, have tried to assess the utility of occupations to society. However, there is a wealth of literature on comparable worth which will be briefly reviewed as it relates to this study.

The ability to compare the value of work performed by people in different occupations has recently become an issue in New Zealand. It is recognised that current and historical discrimination has resulted in inequitable remuneration for women. Legislation, (the Employment Equity Act), which is similar to that introduced in Canada, Britain, United States and Australia, was passed in July 1990 permitting pay-equity claims based on comparisons of job value. The purpose of the Employment Equity Act, according to Mazengarb's Industrial Law Bulletin (Szakats, 1990), is to establish procedures to achieve employment equity. The main objectives

for pay equity are to provide a system that will identify and remove gender-based discrimination in remuneration, and to close the wage gap where women's average ordinary time hourly earnings were reported at 80.3% of men's average ordinary time hourly earnings in February 1988. (New Zealand Business Roundtable, 1988); In May 1986, the wage gap was 79.4%, (Hyman, 1987) which is only slightly less than the figure two years later.

Reasons put forward for this wage gap in New Zealand, which are similar to reasons suggested for wage gaps in most developed countries (Hyman, 1981), include it being due to occupational segregation (women concentrated in few occupations), differing pay levels within occupations, differences in education and training, and differing experience and seniority (Hyman, 1987). The Business Roundtable (1988) added to this list differences in continuity of service; they suggested that patterns of work in high paying occupations were inconsistent with child-rearing, and differences in access to on-the-job training and promotion.

The legislation passed allows evaluation of 'equal pay for work of equal value', (otherwise known as comparable worth, or pay equity), in order to narrow the wage gap. Valuation of jobs has thus become a legal concern (Bellace, 1987). The central difficulty then becomes that of measuring the value of different occupations. Pay equity policies are based on the idea that individuals should be paid according to the intrinsic worth of their jobs, that is, jobs of equal value should be paid equally. This intrinsic worth is usually measured taking job component factors such as responsibility, effort and skill into account (Hegtvedt, 1989). This measurement procedure is often known as job evaluation. Burns (1989) defines job evaluation as a formal method of comparing jobs within an organisation, with the objective of ranking jobs according to their worth to

the organisation. Job evaluation generally uses job analysis as a base for evaluation. Cascio (1987) defines the objective of job analysis as the description of each job in terms of the behaviour necessary to perform it. This analysis can provide a basis for establishing common behavioural requirements across jobs. Job analysis is often used in organisations to determine the salary range of jobs. (Wexley and Yukl, 1984) There are several methods of job evaluation, but essentially they all involve the same basic steps.

Step 1 : Information about the different jobs, such as duties, responsibilities and relationship to other jobs, is collected and recorded through the method of job analysis.

Step 2 : The determination of factors that can serve as a baseline from which jobs can be compared to determine their relative position in the organisation. For example, one factor may be the degree of responsibility associated with a job. Jobs with a higher degree of responsibility may be placed higher in the job hierarchy than low responsibility jobs.

Step 3 : The development or choice of a system to use for the appraisal of jobs according to the factors determined in step 2. A commonly used system, according to Aldrich and Buchele (1986), is the point factor method. This is where pre- determined components of jobs are assigned a value (weighted) and the degree to which a job is comprised of these factors is rated by a panel of people familiar with the job evaluation technique.

Step 4 : The use of the system chosen to evaluate jobs.

Step 5 : The pricing of the job structure obtained through job evaluation eventually resulting in a wage structure. This final step is not part of job evaluation as such, but is the result of job evaluation. (Belcher, 1974)

There are concerns as to how valid job evaluation techniques are, as evaluations of the relative importance of different jobs often reflect biases

and social values. Pay equity, by focusing objectively on relevant job components, is an attempt to decrease the influence of bias and societal values that are not relevant (Hegtvedt, 1989). As human judgement is central to job evaluation, sex stereotyping may influence the evaluation of jobs and people. The context in which job evaluation is applied, and the values and attitudes of those who develop, administer, and maintain it, must be given careful attention if it is to reflect attitudes and practices that are equitable (Shimmin, 1987).

For example, most job evaluation plans that form the basis of employers' compensation programs, use market wage rates to determine the value of job components (Trieman and Hartmann, 1981). If the market rates incorporate bias, the bias will be perpetuated. Therefore market wages should not be used as the sole determinant of the relative worth of work as this may incorporate historical bias (Trieman and Hartmann, 1981). Historical bias occurs as organisations collect information from each other which can perpetuate wage differentials that will not be addressed unless the underlying problem is recognised (Atchinson, 1984). Of course, there can be no absolute standard against which to measure the worth of jobs. There will always be some reflection of value in judgements as to what features of a job should be compensated, and to what extent. It is important to pay all jobs according to the same criteria regardless of the job incumbent (Trieman and Hartmann, 1981). This allows discrimination purely on job factors which cannot be attributed to the individual job incumbent.

Rudman (1989) summarises the weaknesses of job evaluation schemes identified in a report in the United States by the National Academy of Sciences in 1984. According to Rudman, the report states that the ability to replicate existing pay structures is often a measure of how effective a job evaluation scheme is, therefore perpetuating historical bias. The report also

states that bias may be introduced in the choosing and weighting of job components whose values are to be assessed. Sex stereotyping may affect the writing of job descriptions and job descriptions may not reflect the reality of the skill needed or the content of the job. The evaluation of people and jobs is subjective and therefore open to bias. Hyman (1987) supports these conclusions.

Hyman (1985) also suggests that current wages can influence the process of valuing or weighting job factors, explicitly or implicitly. Schwab and Grams (1985) found strong evidence that pay levels associated with the job influenced the evaluator's judgement of job content. The effect of pay on evaluations of jobs is also supported in the results of a study by Mount and Ellis (1987). They investigated the effects of knowledge of current pay levels, and perceived job gender on subsequent job evaluations. They manipulated the pay levels of jobs and found that the jobs with high pay levels received higher evaluations than the low paying jobs. They unexpectedly found evidence, though not significant ($p<0.08$), of a 'pro-female' bias, where evaluation ratings were higher when the job was perceived as female dominant. They propose this as being due to the possibility of the persons selected or volunteering to participate in a comparable worth study having more favourable attitudes to women's work than those who did not volunteer.

Hyman, in a commentary for the National Business Review (Nov. 1986) suggests that the "definition and measurement of skill is largely a matter of judgement and is inherently subjective, however scientific the job evaluation scheme attempts to appear."(pg:16) One potential problem with job evaluation was consistently suggested by the researchers reviewed by Major (1989), and that is, how employees describe their jobs. It was found

that males tended to over-estimate the worth of their work relative to female job incumbents. Identical work can be valued differently, depending on who is evaluating the work, who is performing the work, and the social labels that accompany the work. Hays Lowe and Andrisin Wittig (1989) state that conceptions of job worth may differ between managerial personnel, workers, and owners, and reflect the values of the particular organisation.

O'Neill (1987) feels that it is important to take into account differences in worker productivity, before judging to what extent earnings differences are due to discrimination. Despite the importance of this point, it is difficult to measure productivity directly. Usually variables such as years of experience and education are used as indicators and differences in these variables are reported as accounting for approximately 30 - 40 % of the wage gap, but leaves the remaining 60 - 70% unexplained.

Trieman and Hartmann (1981) state that job segregation by sex is one cause of the wage differential but they did not indicate as to why job segregation occurs. Occupational segregation, where large numbers of women are found in certain occupations, allows some types of work to be labelled 'women's work'. It is argued , that these jobs are paid less because of the fact that they are seen as 'women's jobs', regardless of similarities with work predominantly done by men. This leads to the issue of the undervaluation of so-called 'women's work'. (Trieman and Hartmann, 1981, Hutner, 1986, Taylor, 1989) The employing of women in sex-typed job classes, which are assigned lower pay rates than men doing similar work but in differently labelled jobs, is a kind of sex discrimination, and has been personnel practice in the past. (Taylor, 1989)

Hellenbeck, Ilgen, Ostroff and Vancouver (1987) see the wage gap arising in two ways. Firstly, the demand for labour may constrain the choices of some people, forcing them to choose among jobs with both low monetary and non-monetary rewards. Secondly, suboptimal choices may be made by women on the bases of inaccurate or bias information regarding occupations and/or employers. These choices are seen as resulting from sex-based socialisation that may have occurred long before entry into the labour market. The end result is self-imposed occupational segregation. Shinar (1975) found that sex stereotypes of occupations are clearly defined and held equally by male and female college students. More recently, White, Kruczek, Brown and White (1989) found that, in comparison to Shinar (1975), stereotyping remains present, but not as strong. They also found no difference between men and women's perceptions of occupations. White et al states that this finding is similar to that found in other studies, and therefore suggests that occupational stereotypes are not as a result of sex-specific experience, but rather transmitted as part of a general culture orientation.

The opportunity to move out of segregated jobs is now available, and women can be paid as much as men if they do 'male jobs'. This implies that female jobs are inherently worth less than male jobs (Atchinson, 1984). However, occupations have often been selected for reasons other than money and those women who have invested time and money in training, (for example nurses), would often rather be paid more in line with their worth. (Trieman and Hartmann, 1981).

The Pay Equity: Phase One report for the New Zealand government by Hyman and Clark (1986, p 17) states that " the effect of occupational and industry segregation on pay levels overall, and particularly in female-

dominated areas, is less easy to document unequivocally than the phenomena itself. This is mainly due to problems concerning data on earnings." This report, after extensive searching, identifies the census as the only real source of income data. However they strongly emphasise the inadequacy of this, as the data required is income from all sources, not salary or wage.

Waluchow (1988) raises the issue of what criteria "work of equal value" is to be judged according to. Two types of criteria are available - contribution and dessert. A contribution criterion is where a work's value is judged relative to its functional role. It is the *work* which is valuable and can be expressed in terms of its value to society or to the employer, where it will be a contribution to the desired end, whether it be in saving lives or contributing to profit-making or productivity levels. It is often thought that work of higher skill and responsibility would be more functionally valuable. A dessert criterion, in contrast, is where value lies in the merit of the actual worker. The actual work done might score low on contribution criteria, but if greater effort is expended, or undesirable conditions are endured to achieve the desired ends, then this merits greater reward regardless of the actual functional value of the work.

Therefore, dessert and contribution criteria involve different conceptions of value.

Waluchow feels that "equal value to the employer" suggests contribution criteria at the expense of dessert criteria. If this is the case, then it can lead to undervaluation of the important factors of effort and working conditions.

2.4 RATIONALE

This study is designed to assess the value of occupations to society, using the technique of magnitude estimation. This technique, in past studies, has effectively allowed respondents to estimate the utility (value) of items ranging from measurable commodities, to items of personal value. By using Stevens' power law, the relationship between these values given, and the cost of the items, can be described by a power function.

The utility (value) of occupations is the applied topic chosen as this should be an important aspect in determining pay equity, but has not been measured before this. There is a wage gap in male and female earnings that cannot be wholly justified by differences in factors such as experience, training and working hours. Therefore, it is necessary to look at the value of occupations to society in an attempt to explain the wage gap.

The use of magnitude estimation obtains values for occupations which should disregard the income earned. These values can then be related to income, using the power law and an "average" value of income. Jobs which are either over or underpaid according to their value to society can then be identified with the aid of the power function. The technique of magnitude estimation is useful in indicating the public perceptions of the value of different occupations to society. This could be a logical point from which to further explore the relative importance of occupations in their value to society, and whether this is reflected in the income earned.

The use of two forms of the questionnaire - one with job descriptions, and one without, allows for the fact that individuals may not have a good knowledge of differing occupations, and hence value them on false assumptions of what the job involves. Having a clearer idea of job attributes may affect the way in which its value is perceived.

The dependent variables in this study are the values given to the occupations through the magnitude estimation technique. The independent variables are: whether most of the workers in an occupation are male or female; the type of questionnaire, either with job descriptions or without job descriptions; the gender, socio-economic status, and age of the respondent.

A number of findings are expected from this study in line with the literature. It is expected that, as the percentage of females in an occupation increases, the value of the occupation will decrease, that is, the more an occupation is perceived as 'women's work', the less it is valued. Therefore, the male- dominant occupations should be valued higher overall than the female- dominant occupations. Differences may be found due to the sex of the respondent in the values given to occupations, with the female respondents estimating a higher value for female- dominant occupations than male respondents. As it is expected that males, in general, would have less understanding of female-dominant occupations, they may place a lesser value on those occupations. Therefore, there should be a difference between male and female respondents on the two questionnaire forms, especially in the valuing of female-dominant occupations. Differences due to the form of questionnaire are expected as respondents may not have an accurate understanding of each occupation, thus the provision of job descriptions may alter their perceptions and therefore the values given. Job descriptions

may also encourage respondents to use a different criteria when valuing occupations, that is, dessert criteria rather than contribution.

It is generally expected that male- and female- dominant occupations will be valued in the same way by respondents, thus, the power exponents obtained should be similar. However, male- dominant occupations should be valued consistently higher than female- dominant occupations, therefore a difference in the constants of the power functions should be found.

CHAPTER THREE

METHOD

3.1 RESPONDENTS AND PROCEDURE

The respondents were obtained by randomly generating 13 streets from a Christchurch city road map. Each street was used to distribute 8 questionnaires that had job descriptions and 8 questionnaires without job descriptions. Each dwelling on the randomly generated streets were visited on a Saturday between 11 a.m. and 3 p.m. until either 16 people agreed to complete the questionnaire or there were no more dwellings in that street.

Occupants were asked whether they were willing to complete a questionnaire, provided they were 15 years of age or older. They were told the questionnaire would be collected the following afternoon. If agreeable the respondent was randomly given one of the two forms of questionnaire. Questionnaires were collected the following afternoon. If this was not possible, a stamped addressed envelope was left for the respondents to post the questionnaire to the researcher.

Table 1 shows the street name, geographical location and the number of questionnaires distributed and completed.

Table 1 **Geographical location of sample and the number of questionnaires distributed and collected**

Street	Location	Number distributed	Number completed
Frank Street	Papanui	16	16
Elwyn Place	Avonhead	12	12
Trevor Street	Hornby	5	4
Peterborough Street	City	16	13
Chadlington Street	Parklands	16	15
Drysdale Street	Bishopdale	5	5
Walnut Ave	Bryndwr	16	13
Howard Street	Spreydon	11	8
Hillsborough Terrace	Hillsborough	16	16
Garreg Road	Fendalton	25	18
Shedmore Street	Parklands	15	15
Daytona Place	Parklands	16	9
Hillcrest Road	Russelly	16	16
Total		185	160

The overall response rate is 86%, with 14% of the sample not returning the questionnaire.

The sample totalled 160 respondents, 83 male and 77 female. Table 2 shows the relative numbers of males and females in each age category. The sample contains few women aged 46 or older. The median age group for male and female respondents is 36 - 45 years.

Table 2 Age Distribution and Sex of Respondents

Age	Male	Female	% Male	% Female
15 - 25	14	14	8.75	8.75
26 - 35	12	20	7.50	12.50
36 - 45	16	19	10.00	11.88
46 - 55	14	9	8.75	5.62
56 - 65	12	5	7.50	3.12
66 and over	14	9	8.75	5.62
Unknown	1	1	0.63	0.63
Total	83	77	51.88	48.12

Table 3 shows the socio- economic status (SES) as given by the Irving and Elley (1977) socio- economic index for the female labour force in New Zealand, and the Elley- Irving socio-economic index 1981 census revision (Elley and Irving (1985), and the sex of the respondent for the two questionnaire forms - with and without job descriptions. 32% of the sample could not be coded with a SES index due to their not indicating an occupation, not stating pre-retirement occupations, or being a student or

homemaker. The SES index ranges from 1 to 6, with 1 being the highest socio-economic group.

Table 3 Socio- economic status and sex of respondent for the two questionnaire forms

SES	Male		Female	
	With	Without	With	Without
1	8	7	3	3
2	5	10	4	3
3	9	2	9	6
4	7	3	6	5
5	4	3	3	1
6	3	2	-	3
Uncoded	7	14	11	19
Total	43	41	36	40

3.2 INSTRUMENTS

3.2.1 Development of the Questionnaire

Two questionnaires were used in the study with both featuring the same 52 occupations. One questionnaire displayed the occupation name only, the other the occupation name and a brief job description. (See Appendix A for the questionnaire with job descriptions and Appendix B for the questionnaire without job descriptions.)

The occupations were obtained from Table 6 in the 1986 New Zealand Census of Population and Dwellings, Series C, Report 4. They were chosen in order to have 26 male- and 26 female-dominated occupations, and as many neutral occupations as possible (6). Neutral occupations are those that are performed by males and females and are generally not thought of as being more suited to one sex. It was necessary to choose occupations that are readily understood by respondents and that had available income data. Appendix C shows the occupations used in the study, along with the percentage male/female in each occupation.

The final aspect taken into account in choosing the occupations was the availability of job descriptions. Job descriptions were adapted from the New Zealand Standard Classification of Occupations Manual (1976) to make each of a standard form.

The standard occupation chosen was a Secondary School Teacher and this was given a value of 100. This is a well-known occupation and has approximately the same number of female and male job incumbents. The value of 100 was given as it is easily multiplied and divided and should not

restrict the range of numbers respondents can use. Upper and lower limits were not given to avoid biasing respondents toward category judgement. Eight random orders of the occupations were used to control for order effects. Respondents were required to indicate their own age, sex and occupation. Occupation was used as an indicator of socio-economic status (SES). SES was given using the Elley and Irving Socio-Economic index (1985) and the Irving and Elley Socio-Economic index for the female labour force (1977).

The instructions given to respondents were as follows :

" Following is a list of occupations. Please make an estimate of what you feel, is the value of these occupations to society. Please disregard the income earned by members of particular occupations. Instead, rate the occupations according to how much you feel someone practising it contributes to society as a whole. Estimate the value relative to the standard. The standard is a secondary school teacher who contributes 100 units of value. If you think an occupation is 5 times more valuable to society as a secondary school teacher then assign it a value of 500 units (5 x 100). If you think an occupation is half as valuable then assign it 50 units, and so on. Feel free to use fractions or decimals if you wish. There are no "correct answers"; only consider the value you personally feel the occupation contributes to society."

3.2.2. Income data

The only useful source of income data available for this wide variety of occupations was obtained from the Department of Statistics in unpublished Table 22 from the 1986 Census of Population & Dwellings Series C, Report 8. The data are not salaries or wages for occupation, but rather, the total income earned from all sources. Thus, it is contaminated

by income from rents, dividends, and interest. The median incomes for each occupation can be seen in Table 4. As the income data is income from all sources, it is not an accurate indicator of salary for occupation. It is difficult to judge the extent to which this data is contaminated by the other factors mentioned, however it is unlikely that it would be balanced with wage increases over the last four years, and errors such as under estimation of income earned, and rounding errors. Thus it is expected that the median income reported here is in fact lower than it is in reality.

3.2.3. Pilot Study

The two forms of the questionnaire were piloted on volunteers from a local high school night class. They were asked to complete the questionnaire, note the time taken, and identify any problems they had. It was also made clear that they could make suggestions as to how it might be improved. The comments made resulted in the shortening of the job descriptions and the re-wording of the instructions.

The revised questionnaires were piloted on five volunteers in Auckland and no further problems were identified.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

The data was analysed using Statview and CLR ANOVA on the Apple Macintosh. As suggested by Stevens (1974), the log of the median estimated values was plotted against the log of the median incomes obtained for each occupation giving a linear function, whose slope is a direct measure of the power exponent.

The line of best fit when logged median values are plotted against logged median income gives the regression equation from which the power function is obtained. The slope of this line, gives the exponent of the power function. The constant is useful when analysing whether one group estimates a higher overall value of occupations than another group, or whether male- dominant occupations are valued higher overall than female- dominant occupations. The amount of variance the line of best fit accounts for (R- Square) is also calculated; from this the correlation between the logged estimated values and logged median income can be assessed.

The group and individual data are presented. The group data can be useful in illustrating the median perception of the individuals as to the value of occupations. This gives a global view which may or may not be a

good description of individual respondents' valuations. Individual respondents' data were analysed to check whether, in fact, the global view was an accurate description of individual respondents' estimations, and whether there were significant differences in the valuations.

The median income used for each occupation can be seen in Table 4. The median income was calculated using the data from both male and female job incumbents despite the fact that, for most occupations reported in the census, female incumbents had a consistently lower median income than their male counterparts.

Following is a brief summary of what is presented in each section :

4.2 Simple regression of the occupation values obtained against their median income for all respondents, obtaining an overall power function describing the relationship between the value of occupations and the income.

4.3 This section presents a table with the median values of respondents for each occupation with median income, the interquartile range of the estimated values and the value predicted using the power exponent.

4.4 Frequency distributions of the exponents and constants from individuals' power functions.

4.5 The effect of respondent gender on the estimated values, and on the relationship between value of occupation and income.

4.6 The effect of the form of questionnaire on the estimated values and on the relationship between value of occupation and income.

4.7 The difference in valuation of male- and female- dominant occupations, and the difference in their relation to income.

4.8 The combined effect of the sex domination of occupations, the form of questionnaire, and gender of respondent on the valuations.

4.9 The effect of the percentage of the female job incumbents in each occupation, and the effect of the income for each occupation on the valuations.

4.10 Correlations of age to the estimated values of each occupation.

4.11 Correlations of SES to the estimated values of each occupation.

4.2 RELATIONSHIP BETWEEN ESTIMATED VALUES AND INCOME

Simple regression was used to analyse the degree of relationship between the median estimated value of the occupations and the median incomes for those occupations. Figure 1 shows the median estimated values of each occupation relative to its median income, with a regression line $y = 0.002x + 31.787$, $r^2 = .522$. Figure 2 shows the logged median estimated values relative to the logged median income with a regression line $y = 0.679x - 1.016$, $r^2 = .595$.

Figure two is a better description of the relationship between value and income of occupations as a slightly higher R-Square was obtained. This indicates that a higher percentage of variability in the estimated values is predictable from the variability in the income when the data is logged. The fact that R-Square is higher with the logged values implies that a power function is a better description of the value - income relationship than a straight line. This result forms the justification for the power function analysis used in the rest of the thesis.

The correlation between the logged median estimated values and the logged median income is low (r (57) = .77. p < .001) suggesting that the logged median estimated values were not well described by the logged median

income. This is expected as factors other than value affect income and vice versa.

4.3 ESTIMATED AND PREDICTED VALUES FOR OCCUPATIONS

Table 4 shows the occupations in decreasing order of median estimated value. The dominant sex of each occupation is given together with its median income. The interquartile range is the middle 50 percent of the values given. There is a greater range of scores within the higher valued occupations than within the lower valued occupations thus, the median score will be more indicative of individual respondents values for the lower valued occupations, but not for the occupations that have a higher median value. The predicted values were predicted from income using the power function. When the predicted value is lower than the median estimated value, then the occupation is considered to be underpaid. The occupations that are undervalued are indicated by a *, those occupations that have the same estimated and predicted values are indicated thus **. Only on 3 occupations - fireperson, accountant and hostel manager, is occupational value predicted exactly by income. 12 male and 10 female occupations are underpaid according to their estimated value to society.

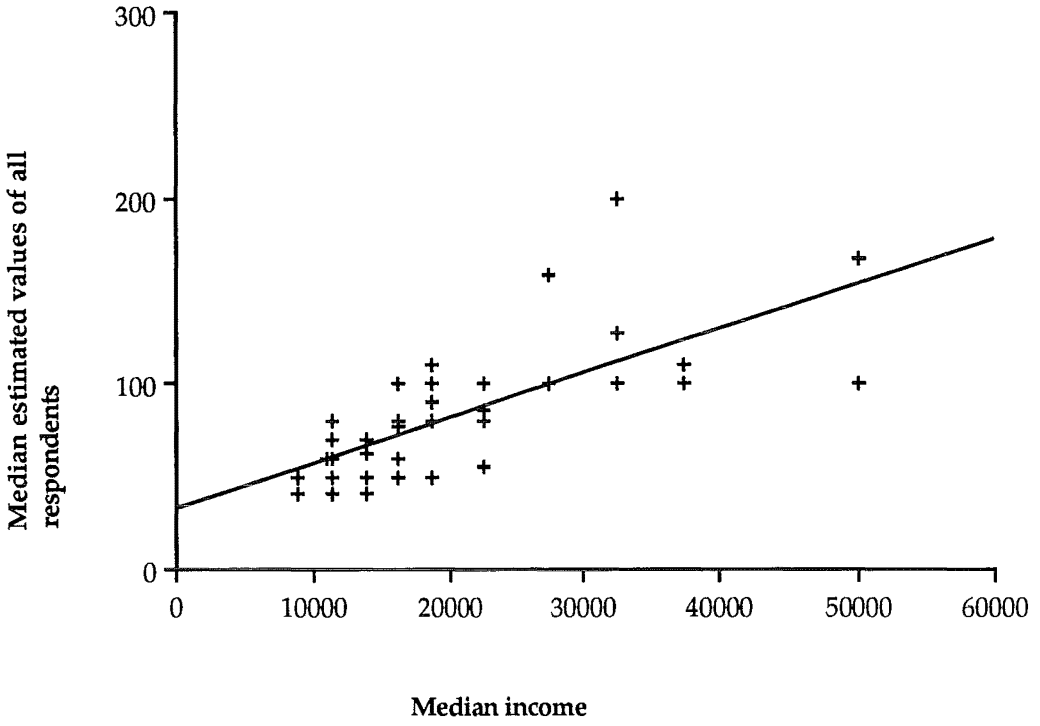

Figure 1 : A scattergram of the median estimates of the value of occupations as a function of the median income for the occupations.

Figure 2 : **A scattergram of the logged median estimated values as a function of logged median income**

Table 4 : Occupations, dominant sex of the occupation, median income, actual estimated value, the interquartile range of those values and the predicted value.

Occupations	Dominant sex	Median income	Median estimated values	Interquartile ranges	Predicted values
Doctor	Male	32500	200	180	112
Judge	Male	50000	167.5	200	149
Police	Male	27500	160	200	100
School Principal	Male	32500	127.5	100	112
Lawyer	Male	37500	110	120	123
Registered Nurse *	Female	18750	110	100	77
Dentist	Male	37500	110	72.5	123
Physiotherapist *	Female	8750	100	70	77
University Lecturer	Male	37500	100	50	123
Veterinary	Male	32500	100	72.5	112
Occupational Therapist *	Female	16250	100	65	70
Accountant **	Male	27500	100	70	100
Builder *	Male	18750	100	35	77
Prison Officer *	Male	22500	100	75	87
Primary School Teacher *	Female	22500	100	50	87
Traffic Officer *	Male	22500	100	110	87
Ambulance Driver *	Male	22500	100	115	87
Airline Pilot	Male	37500	100	100	123
Kindergarten Teacher *	Female	16250	100	20	70

Social Worker *	Neutral	18750	100	75	77
Member of Parliament	Male	50000	100	133.75	149
Secondary School Teacher *	Neutral	27500	100	0	100
Fireperson **	Male	27500	100	120	100
Electrician *	Male	18750	90	30	100
Dental Nurse	Female	22500	85	30	77
Plumber *	Male	18750	80	50	77
Motor Vehicle Mechanic *	Male	16250	80	30	70
Librarian *	Female	18750	80	50	77
Carpenter *	Male	16250	80	40	70
Administration Officer	Neutral	22500	80	50	87
Hospital/Nurse Aid *	Female	11250	80	50	54
Drainlayer *	Male	16250	77.5	40	70
Hospital Orderly	Male	13750	70	50	62
Hostel Manager **	Neutral	13750	62.5	15	62
Bus Driver	Male	16250	60	50	70
Restaurant Manager	Neutral	16250	60	35	70
Accounts Clerk	Female	16250	60	30	70
Data-Processing Operator	Female	16250	60	40	70
Veterinary Assistant *	Female	11000	60	47.5	53
Secretary-Typist	Female	16250	60	32.5	70
Bank Teller *	Female	11250	60	32.5	54
Aircraft Steward/ess	Female	22500	55	45	87
Painter	Male	13750	50	37.5	62
Waiter/ess *	Female	8750	50	37	46
Telephone Operator	Female	16250	50	40	70
Kitchenhand	Female	11250	50	35	54
Hairdresser	Female	11250	50	40	54

General Clerk	Female	13750	50	35	62
General Typist	Female	16250	50	35	70
Mail Sorting Clerk	Neutral	16250	50	40	70
Receptionist	Female	13750	50	46	62
Milk Vendor	Male	18750	50	35	77
Shop Assistant	Female	11250	50	40	54
Sewing Machinist *	Female	8750	50	45	46
Hotel Porter	Male	11250	40	30	54
Florist	Female	8750	40	40	46
Bartender	Male	13750	40	35	62

* = under paid

** = accurately predicted by the power function.

4.4 FREQUENCY DISTRIBUTIONS

Figures 3 and 4 show the frequency distribution of the exponents and the constants from the log of the median group data regressed against the log of median income.

The distribution of the exponents is slightly positively skewed, and the distribution of the constants is slightly negatively skewed. However, both are slight enough to justify the use of mean scores thus permitting the use of parametric statistics which require normal distributions.

4.5 EFFECT OF RESPONDENT GENDER

Figure 5 is a scattergram showing the log median estimated values given by female and male respondents against the log median income of the occupations . A difference between the female and male regression lines can be seen. (Male y = .577x - .57; Female y = .794x - 1.519)

ANOVA was used on the individual male and female respondents' power functions to see whether this difference was significant. A slight significant difference was found between the exponents of the power function (F (1,157) = 3.943; $p < .05$). The mean individual male exponent is 0.8 and the mean individual female exponent is 0.945. The mean individual constant for females is -2.176 and -1.544 for males. This is also a significant difference (F (1,157) = 3.835; $p < .05$). For the group data the correlation between the male respondents' estimated log median values and log median income is r (157) = .79, $p < .001$. The female respondents correlation is r (157) = .74, $p < .001$.

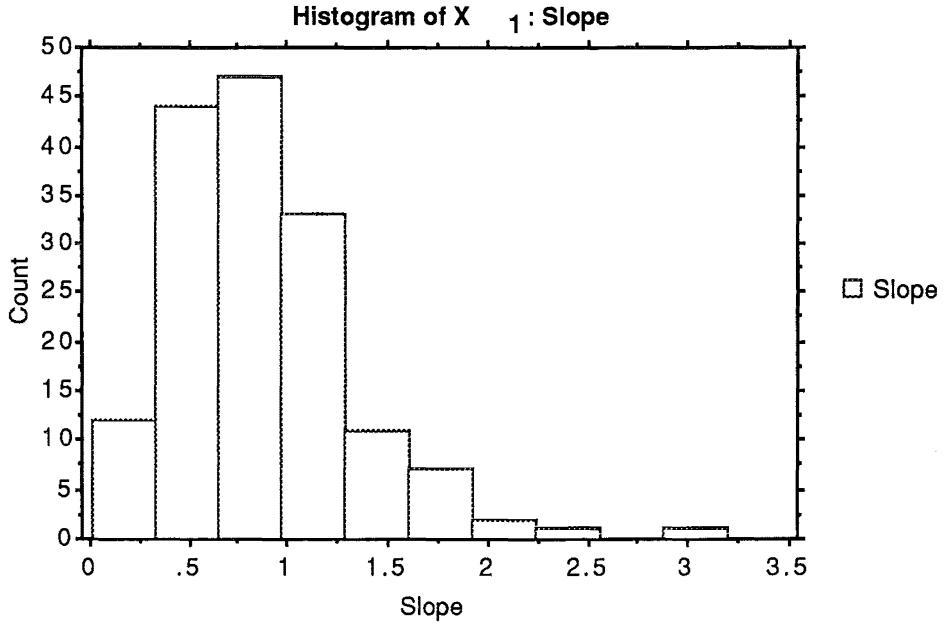

Figure 3 : A histogram showing the frequency distribution of the slopes obtained from the regression equations of the individual data.

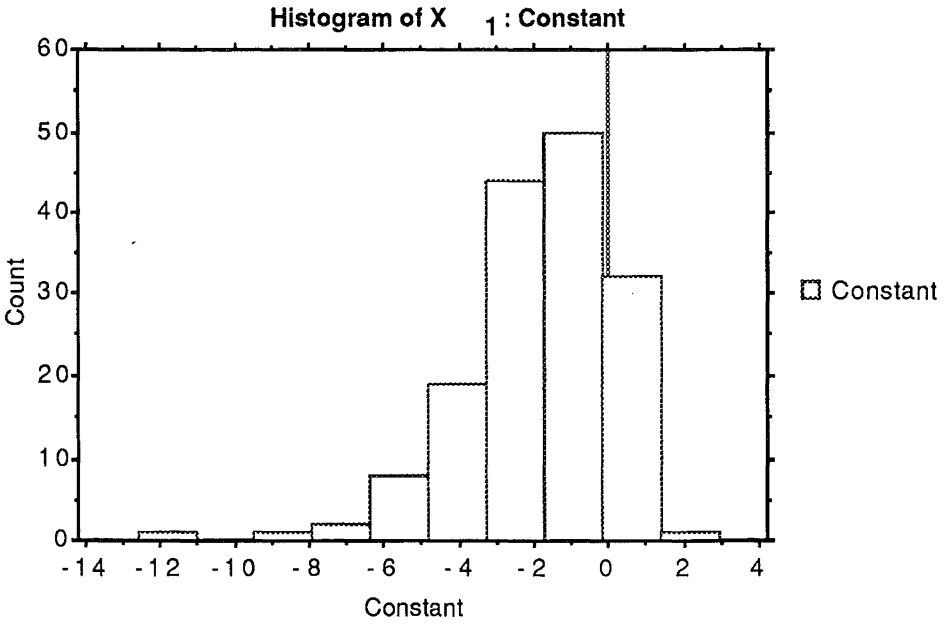

Figure 4 : A histogram showing the frequency distribution of the constants from the individual respondents regression equations.

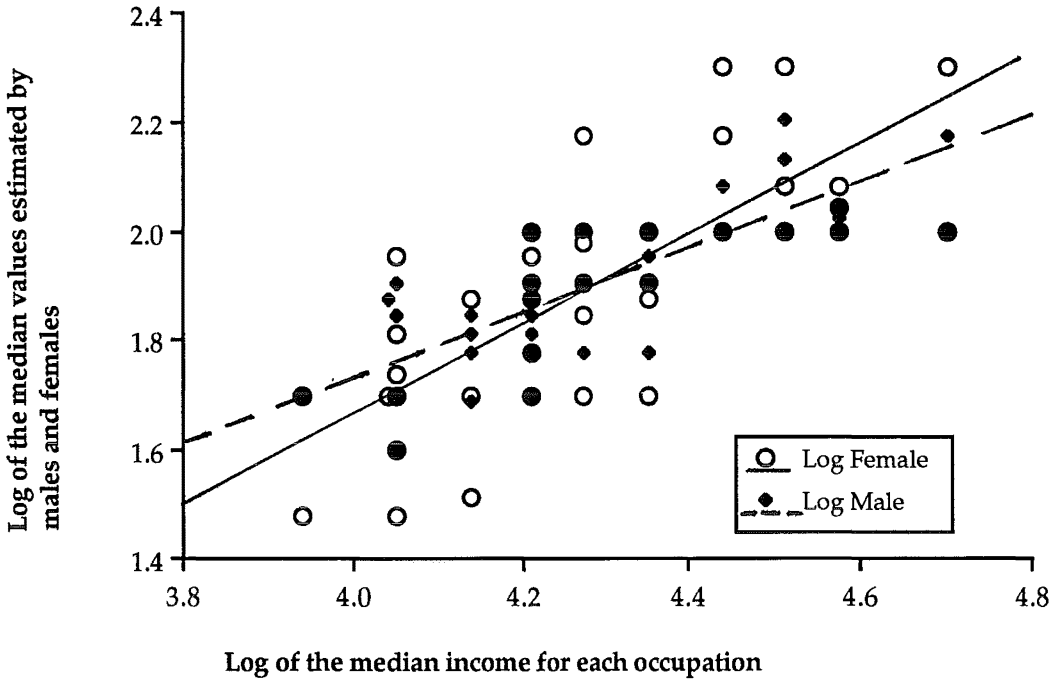

Figure 5 : **A scattergram of the male and female respondents log median estimated values as a function of log median income.**

ANOVA on the individual r^2 for the male and female participants gives the female mean r^2 as .344 and the male mean r^2 is .369. No significant difference was found. (F (1,157) = .951; *n.s*). The higher exponent obtained by female respondents indicates that females tend to value the lower income occupations less than the male respondents, and value the higher income occupations more than male respondents. The significant difference found in the constants between males and females suggests that, overall, female respondents are valuing occupations slightly lower than the male respondents. The fact that there is no significant difference in the individual male and female respondents R-Squares indicates that the power functions obtained by both groups are similar in the way they predict value from income. The expectation that there would be differences between male and female respondents is fulfilled, although the difference is not large.

For the group, the correlation between the female median estimations and the male median estimations is r (57) = .91, $p < .001$. As there is a large difference between the exponents obtained for the male and female power functions on the group data and the mean individual exponents, the group data is not a very accurate representation of the individual respondents' average valuations.

4.6 EFFECT OF THE FORM OF QUESTIONNAIRE

Figure 6 shows the log median estimated values of all respondents who completed either the questionnaire with job descriptions or the questionnaire without job descriptions. These values are regressed against the log median incomes for the occupations. The regression line for the respondents who completed the questionnaire with job descriptions is y =

.727x - 1.211, with a correlation between log median value of occupation and log median incomes of r (57) = .08, p < .001. The regression line for the respondents who completed the questionnaire without job descriptions is described as y = .671x - .993, with a correlation of r (57) = .73, p < .001.

It was expected that there would be significant differences between the two forms of the questionnaire in the valuation of the occupations. ANOVA shows no significant difference in the exponents or the constants of the individual respondents power functions for the two forms of the questionnaire. (Slope F (1,157) = 0.452, *n.s* and constant F (1,157) = 0.386, *n.s*). However, there is a significant difference in the R-Square (F (1,157) = 5.605, p <.01) with the mean individual R-Square being 0.326 for the questionnaire with job descriptions and 0.388 for the questionnaire without job descriptions. For the group, there is a high correlation between the questionnaire forms in the estimated values given to the occupations (r (57) = .94, p < .001). Therefore, in this case, the group data is an accurate representation of the individual respondents estimations. There was no effect of the questionnaire form on the way respondents value occupations, and it did not significantly increase or decrease the magnitude of values given: thus, the expectations were not fulfilled. However, it was found that the questionnaire without job descriptions was significantly different from the questionnaire with job descriptions in that a greater percentage of the variability in the income is accounted for by the variability in the values estimated. This is perhaps due to respondents on the different questionnaire forms using a different criteria in estimating the value of occupations to society. However, there is little evidence of this, as no difference was found in the exponents or constants.

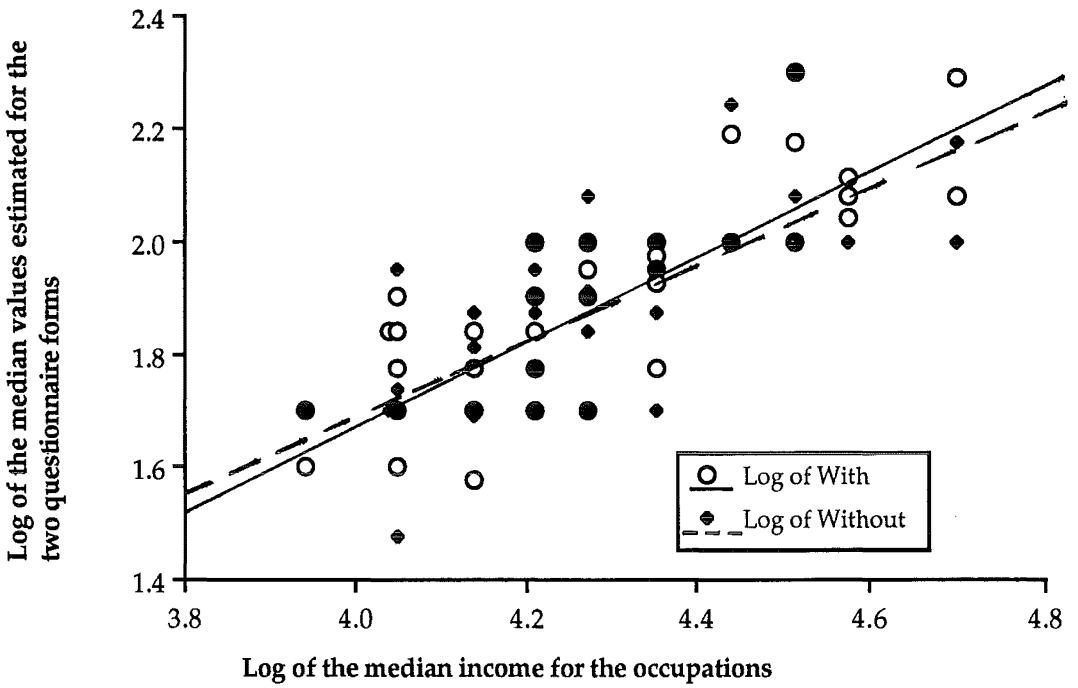

Figure 6 : **A scattergram of the log median estimated value of the occupations for the two questionnaire forms, against the log median income of the occupations.**

4.7 MALE- AND FEMALE- DOMINANT OCCUPATIONS

As expected, a significant difference was found between the log median estimated values of all respondents on female- and male-dominated occupations, (F (1,51) = 16.324; p <0.001), with the female-dominant occupations having a mean value of 1.805 and the male-dominant occupation with a mean of 1.965. Male- dominant occupations were thus valued higher than female- dominant occupations. There is also a significant difference in the log median incomes for male- and female-dominant occupations, (F (1,57) = 29.093; p <0.0001), where male occupations have a mean log median income of 4.38, and female occupations have a mean of 4.148. Clearly, this difference could account for the differences in the valuations found. Figures 7 and 8 show, respectively, the group log median estimated values for the female- dominant occupations and the male- dominant occupations regressed against log median income.

Paired t -tests on each respondents power function for the male- dominant occupations and for the female-dominant occupations showed no significant differences, in either slope or constant (Slope - t (157) = -0.23; *n.s.* Constant - t (1,157) = 0.102; *n.s*). The fact that the power functions for the male- and female- dominant occupations, obtained for each individual, do not differ, suggests that the relationship between estimated value and income is the same for male- and female- dominant occupations.

4.8 THE INTERACTION OF MALE- AND FEMALE- DOMINANT OCCUPATIONS, GENDER OF RESPONDENT AND FORM OF QUESTIONNAIRE

The interactions of the dominant sex of occupations, gender of respondent and form of questionnaire were analysed using the individual respondents power functions. Some of the expectations were that female respondents will value female-dominant occupations more, and that the questionnaire with job descriptions may increase the male respondents awareness of female occupations which may result in a higher estimated value being given.

CLR ANOVA, with the three main factors, dominant sex of occupation, gender of respondent and form of questionnaire, allows the identification of whether or not these factors interact with each other or significantly affect the values given.

There was no significant effect of the sex of respondent, (F (1,154) = 2.33, *n.s*), the form of questionnaire, (F (1,154) = .824; *n.s*), or the dominant sex of the occupation, (F (1,154) = .074; *n.s*), on the exponents.

No two-way interaction was found between the sex of respondent and the form of questionnaire, (F (1,154) = .524; *n.s*), between the sex of respondent and the dominant sex of the occupations, (F (1,154) = .10; *n.s*), or between the form of questionnaire and the dominant sex of the occupation, (F (1,154) = .96; *n.s*) on the exponents.

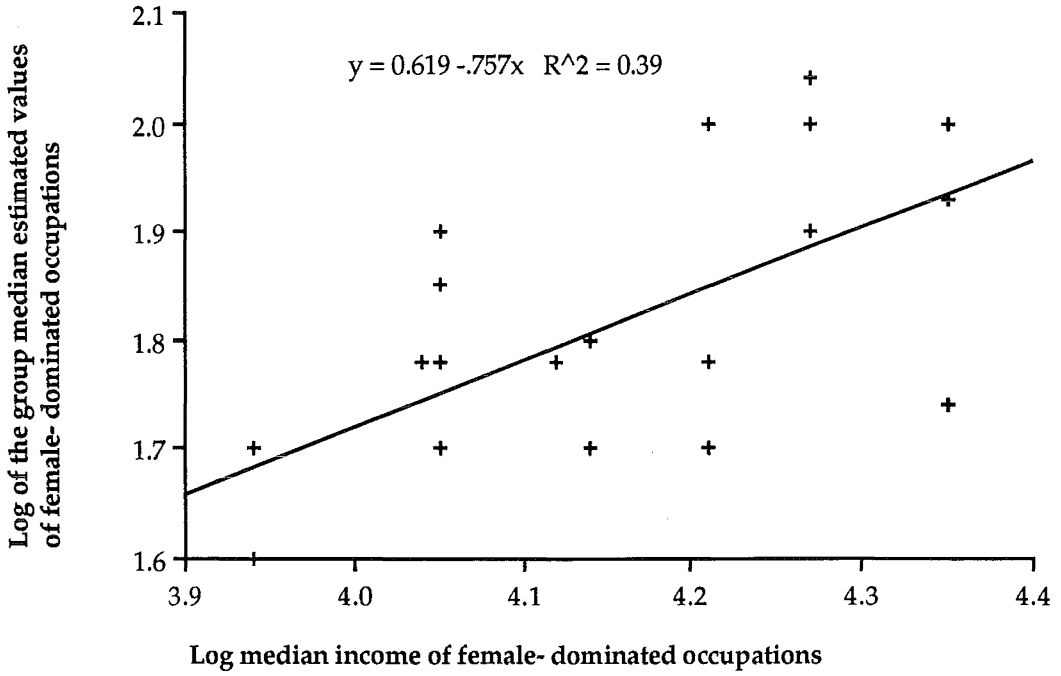

Figure 7 : **A scattergram of the log median estimated values for the female- dominant occupations as a function of the log median income**

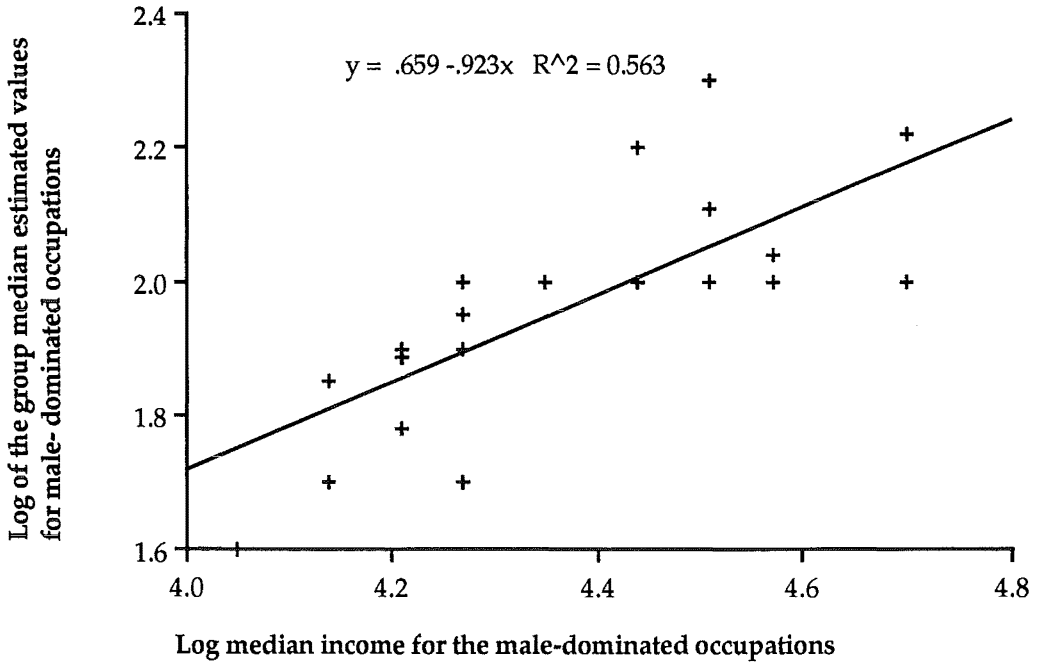

Figure 8 : **A scattergram of the log median estimated values for the male-dominant occupations as a function of log income**

No three-way interaction was found between the sex of respondents and questionnaire form on the individual respondents exponents for the male-dominant and female- dominant occupations, F (1,154) = 1.586, *n.s* ' Table 5 shows the mean exponents for each combination of conditions.

Table 5 : The means of the individual exponents for the interactions between sex, questionnaire form, and the dominant sex of the occupation

Respondent Sex	Questionnaire	Occupation dominant sex	Mean exponent
Male	With descriptions	Male	.78
Male	With descriptions	Female	.66
Male	Without descriptions	Male	.80
Male	Without descriptions	Female	.87
Female	With descriptions	Male	.87
Female	With descriptions	Female	.89
Female	Without descriptions	Male	.90
Female	Without descriptions	Female	.89

Similar findings emerged from the analysis of the individuals' constants. Table 6 shows the mean constants for the different combinations of conditions.

There was no effect of sex of respondent, (F (1,154) = 1.63, *n.s*), the form of questionnaire, (F (1,154) = .394; *n.s*), or the dominant sex of the occupation, (F (1,154) = .003; *n.s*), on the constants.

No two way interaction was found between the sex of respondent and the form of questionnaire, (F (1,154) = .251; *n.s*, between the sex of respondent and the dominant sex of the occupations, (F (1,154) = .021; *n.s*), or between the form of questionnaire and the dominant sex of the occupation, (F (1,154) = .379; *n.s*) on the constants.

No three-way interaction was found of sex and questionnaire form on the individual respondents constants for the male- dominant and female-dominant occupations, F (1,154) = 0.941, *n.s*.

Table 6: The means of the individual constants for the interactions between respondent sex, form of questionnaire, and the dominant sex of the occupation

Respondent Sex	Questionnaire	Occupation dominant sex	Mean constant
Male	With descriptions	Male	-1.44
Male	With descriptions	Female	-1.20
Male	Without descriptions	Male	-1.52
Male	Without descriptions	Female	-1.83
Female	With descriptions	Male	-1.86
Female	With descriptions	Female	-1.91
Female	Without descriptions	Male	-1.97
Female	Without descriptions	Female	-1.89

The means for the different combinations of conditions for R-Square can be seen in Table 7.

Table 7: The means of the individual R - Square values for the interaction between respondent sex, form of questionnaire and the dominant sex of the occupation

Respondent Sex	Questionnaire	Occupation dominant sex	Mean constant
Male	With descriptions	Male	.22
Male	With descriptions	Female	.34
Male	Without descriptions	Male	.23
Male	Without descriptions	Female	.51
Female	With descriptions	Male	.26
Female	With descriptions	Female	.24
Female	Without descriptions	Male	.23
Female	Without descriptions	Female	.56

No significant effect was found of sex of respondent on the R -Squares (F (1,154) = 0.011, *n.s*). However there was a significant effect of the dominant sex of the occupation, (F (1,154) = 8.052; p <.005), with the mean male r^2 = 0.234 and the mean female-dominant occupation r^2 = 0.416. This result indicates that the variability in the female-dominant occupations values can be attributed to the variability in the income for these occupations to a greater degree than in the male-dominant occupation condition. There is

also a significant effect of the form of questionnaire, (F (1,154) = .5.52; p <.02), with the mean R- Square for the questionnaire without job descriptions being higher at 0.384 than the mean R- Square for the questionnaire with job description (0.266). This supports the findings reported in section 5.6.

No two-way interactions were found between the sex of respondent and the form of questionnaire, (F (1,154) = .324; p < .57), between the sex of respondent and the dominant sex of the occupations, (F (1,154) = .114; p <.74) or between the form of questionnaire and the dominant sex of the occupation, (F (1,154) = 4.018; p <.05) on the R -Square. No three-way interaction was found between the sex of respondents, the form of questionnaire and the sex- domination of the occupations on the R-Square, F (1,154) = 0.552; p < .46.

Overall, these results further confirm that the sex of the respondent, and the form of questionnaire have no significant effect on how male- and female-dominant occupations are valued. This seems to indicate that there is a high degree of agreement as to the value of these occupations to society.

4.9 THE VARIANCE IN VALUATIONS ACCOUNTED FOR BY INCOME AND THE PERCENTAGE FEMALE OF THE OCCUPATIONS

Multiple regression was used to test how much of the difference in male- and female- dominant occupations (as was actually found in section 5.7) is due to the degree an occupation is dominated by females, and how much is due to the differing incomes of the male- and female-dominant occupations. Log median values were regressed on both the percentage of female incumbents of the occupations, and the log income. This analysis was repeated using the log percentage female to check whether the logged

values account for a greater degree of the variability in the income that can be attributed to the values given.

A significant overall effect was found, (F (2,53) = 39.43; p <.001, r^2 = .06). Income accounts for most of the variance with a beta coefficient of 0.672; p <.0001. The log percentage female accounts for more variance than the non- logged values. The logged percentage female beta is -0.002, p <.93, the non- logged beta is -0.000029, p < .95. These beta values are very low and insignificant. From these results it can be clearly seen that income is the only factor that significantly accounts for the variance in the logged median estimated values, a result which essentially replicates the findings reported in the above sections.

4.10 CORRELATIONS BETWEEN AGE AND VALUATIONS

Correlations between the age groups of respondents and the occupation values estimated show that, the older the age group, the higher the value given to these occupations.

Hotel Porter r (158) = .26; p < 0.01

Painter r (159) = .19; p < 0.05

Florist r (158) = .21; p < 0.05

Librarian r (158) = .21; p < 0.05

One significant negative correlation was found where the younger the age group, the higher the occupation was valued. This was for the occupation of social worker (r (158) = -.22; p <0.05).

4.11 CORRELATION BETWEEN SOCIO- ECONOMIC STATUS AND VALUATIONS

Two significant positive correlations were found for SES index and the valuation of occupations.

Hotel porter $r(108) = .2; p < 0.05$

Hostel manager $r(109) = .22; p < 0.06$

Higher SES index means lower socio-economic status so the lower the SES status the higher these occupations are valued.

CHAPTER FIVE

DISCUSSION

5.1 GENERAL FINDINGS

The results of this study show that some occupations are underpaid according to their value to society. By using the power function obtained to predict value from actual income, a close-to-even number of male- and female-dominant occupations were found to be underpaid in comparison to the median estimated values given by the general public sample. In general, the results do not support the idea that female-dominant occupations are underpaid relative to male-dominant occupations.

The power function used is a moderate predictor of value in relation to income as is suggested by the correlation between the logged estimated values and the logged estimated income. As in Kemp's (1988, 1989) utility studies, utility is not expected to be the only factor that contributes to how an item is 'priced' or, in this case, paid. In this study, factors such as geographical location, and remuneration policies of organisations, affect the income of an occupation. Therefore it is not surprising that only a moderate correlation was found between the log median income and the log median estimated values. Despite only obtaining a moderate correlation, the use of a power function was appropriate, as suggested by the results reported in section 4.2, and seen in figures 1 and 2. However, it should be noted that the

correlation may be stronger if the income data for the occupations was accurate.

The finding that both male and female respondents estimated similar values for the occupations can support the argument that pay is not inequitable due to sex discrimination, where female-dominant occupations are underpaid as they are perceived as 'women's work'. If discrimination against women's work was the main cause of the wage gap, it would be expected that women should value women's work higher than the value given to it by males. The fact that males and females value the occupations similarly suggests that either both males and females discriminate against women's work, or discrimination on the basis of the sex-domination of the occupation is not the main cause of wage differentials. It may be possible that this result is an indication of what White et al (1989) concluded was a general cultural orientation. They found occupational stereotypes to be similarly held by male and female college students, and it is likely that the sample used in this study are similarly affected.

It could be argued that 'women's work' is undervalued because of occupational stereotypes. If this was true, the percentage of female incumbents in an occupation should have been found to be an important factor. In fact, it was insignificant, and income was found to be the only factor accounting for the variability in the values relative to the variable incomes. The results of this study are similar to the magnitude estimation findings reported by Coleman and Rainwater (1978). Income resulted in a regression coefficient of 0.54 and was found to be the most important factor in the determination of social status. The power exponent of 0.679 obtained in this study is in the range of 0.6 - 0.7 reported by Stevens (1974) that has been found in studies relating status to income. It is possible that the utility

of occupations to society would be highly correlated to estimated social status and/or occupational prestige as income is an important factor in their determination

The provision of job descriptions did not have a great impact on the values estimated by the respondents. This may be explained either by the respondents already having an accurate conception of the occupations presented to them, or by the descriptions being disregarded or not thoroughly read. It was expected that job descriptions might encourage respondents to value the occupations using Waluchow's (1988) dessert criteria, rather than contribution criteria. This did not happen. It was also expected that male respondents might value female-dominant occupations differently when the job descriptions were given. This also was not found, giving strong support for the argument that those 'women's jobs' that are low paid are, in fact, not highly valued.

The questionnaire without job descriptions does generate a higher correlation between income and value. It could be that the job descriptions simplified the tasks involved in a job, thus the occupation was valued more inaccurately. It is also possible that the provision of job descriptions meant that respondents focused less on perceived income than those who completed the questionnaire without job descriptions.

It is surprising to find positive correlations between the values given to occupations and the age of the respondents on four of the occupations - Hotel Porter, Librarian, Florist and Painter. This means, the older the respondent, the more these occupations are valued. It may be that older people have a greater need for, or experience of these occupations. The same explanation can be used for the negative correlation between value of occupation and age found for the occupation of Social Worker. Younger

people may have a greater awareness or contact with Social Workers than older people. However, these explanations seem unlikely.
The finding that those with a lower SES index, value Hotel Porters and Hostel Managers more than people with a higher SES index, is difficult to explain.

The overall results seem to suggest that the lower income earned by female- dominant occupations is actually in line with the value these occupations are given by society. Thus, it would have to be concluded that there is not inequitable remuneration due to occupations being either male- or female- dominant. It is perhaps more important to study why women still dominate in occupations that are lowly paid and of little perceived value to society.

5.2 GENERAL DISCUSSION

Magnitude estimation does not provide dollar values, as utility measures previously used to assess comparable worth can do. However, it is useful as an indication of a global attitude of the public perceptions of the value of different occupations to society. By using the magnitude estimation technique it is possible to move away from the organisational influence on values which has been found to bias evaluations of jobs in the past. Magnitude estimation provides a focus on what Waluchow (1988) described as contribution criteria, where the value of the occupation is its perceived value to society. This focus is an important part of a comparable worth study, as value to society is an important aspect that is not often considered. At the very least, value to society affects the demand for the different occupations, therefore it is also an important economic

consideration. The magnitude estimation technique is also a way of estimating what the general public feel is the intrinsic worth of jobs. As Trieman and Hartmann (1981) suggest, pay according to intrinsic worth is what compensation policies should aim for. By disregarding income, the values are not greatly affected by market rates, but reflect people's value judgements. The relatively low correlations between the estimated values and median income found in this study tend to suggest that the intrinsic worth of occupations is not perfectly reflected in income.

The magnitude estimation approach and the use of a general public sample also disregards variations across companies, industries and geographical locations which can blur the evaluations of jobs due to differing needs and resources of the organisations. For instance, because an organisation is small, the occupations pursued in it are not necessarily less valuable to society than the same occupations in a larger organisation, although pay may be less in the smaller organisation.

As job evaluation is always plagued by social values, however one attempts to control for it, the present research deliberately assesses the impact of social values. Identifying social values and how they effect the evaluation of jobs can be a step toward understanding why some jobs tend to be lower paying.

The results from the study appear to support Mosteller and Nogee's (1957) suspicions that individuals have subjective values that are similar, especially in that most of the average data obtained describes the individual estimations fairly well.

One advantage of the technique of magnitude estimation lies in its simplicity, which allows a large general population sample to be used.

5.3 LIMITATIONS OF THE STUDY

One limitation of this study is the income data used. It is recognised that there is a serious need for accurate salary data in New Zealand (Hyman and Clark, 1987). The only viable source of salary data for this study was the 1986 census which only required people to indicate total income from all sources and their occupation. There are five problems associated with this. Firstly, it can be difficult to code the information people provide as to what their occupation is. For instance the occupation of clerk can cover a number of different jobs. In this study, in each case where occupation was not specific, the most general category was used. Secondly, as the required information is income from all sources, the final result is not purely salary earned, but is contaminated by income such as rents, interest, dividends. It is, however, impossible to assess the proportion of the income that can be attributed to items other than salary. Thirdly, people are often reluctant to reveal accurate information regarding their income despite assurances that the information will not be used for Inland Revenue purposes, or in the policing of government benefits and subsidies. The fourth problem is the way the data is grouped in the presentation of the table. The final category is $50,000 and above, and other categories are divided unevenly, for example $35,000 - $40,000, and $40,000 - $50,000. The difference between categories of lower income groups is only $2,500. The final problem is that full time work is described as 30 hours a week. Within this, factors such as penal rates and overtime earned are incorporated but not identified, so may affect the average weekly wage. No account is taken of shift work or rotating shifts

which may also have an effect on total income. This is likely to effect the representation of income for women as they are more likely to have shorter working hours than men, mainly due to child care. In order to have an accurate representation of the relationship between the societal value of an occupation and its reward, more accurate salary data needs to be used.

This study cannot identify possible explanations for the wage gap. It only indicates how valuable an occupation is to society in relation to the standard given. By simply requiring respondents to do this task, it is not possible to assess on what criteria they base their judgements. By valuing occupations on contribution criteria, there is the problem of actually undervaluing important, stressful, or unpleasant work, because it is not seen to contribute to society. However the occupation may be a valuable input in achieving a desired end. Thus, it is important to also assess utility on Waluchow's (1988) dessert criteria as well as contribution criteria. This study does not clearly allow this, although respondents may, in fact, have used both criteria in assigning values, or alternatively, it might be that the instruction "estimate value to society" block the use of dessert criteria. The lower R-Square obtained by the questionnaire with job descriptions may be an indication that a different criteria is being used. Perhaps clear instructions of what to consider when assigning values, incorporating dessert and contribution criteria, would result in more meaningful utility estimates on some occupations.

Another problem with this study is that it is not known how familiar respondents are with the occupations presented to them, nor how accurate is their perception of how much each is paid. This is important, as research (for example, Mount and Ellis; 1987) has shown that knowledge of salary does affect how an occupation is rated. It also seems likely that a

respondent's familiarity with an occupation will impact upon the value given, in either direction.

Closer attention should be paid in the choice of occupations to the spread of salaries, and the socio-economic status of the occupation. It is unfortunate that the majority of females occupations are in the lower income bracket. If more female-dominant occupations in the upper income bracket could be used, there would be a clearer indication of whether it is the lower income that leads to lower value, or whether it is actually the occupation itself that is not seen as contributing highly to society, or whether it is the fact that the occupation is female-dominant that causes its value to be downgraded. In the present study socio-economic status was not controlled for. It is possible that the perceived status of occupations may account for a large amount of the variance in values between occupations.

5.4 FUTURE RESEARCH

In order for the magnitude estimation technique to be useful in assessing pay equity, this researcher has suggestions for the expansion of this study.

It is important to establish whether female-dominant occupations are valued less because they are generally paid less, or whether they are actually less valuable to society because they are considered "women's work". In order to do this there is an overwhelming need is to obtain accurate salary data. At present this would require the researcher to survey organisations, either nationwide or within one geographical region, to establish pay rates. This would generate more accurate data until some method to collect this

data consistently and thoroughly from all organisations nationally is introduced in New Zealand. Another option would be to use the upcoming census data when it is published. Obviously this would be more accurate than the 1986 census, however it will be plagued by the same problems as the 1986 census unless the form of the questions were changed.

It would be useful in terms of interpreting the results of this study to assess the relationship between occupations using the accurate and inaccurate salary data. Salaries will probably be higher than reported in this study, but it is not clear whether the relative difference in salary between the occupations would remain the same. This is important as it affects the determination of which occupations are under- or over-paid using the power function.

Related to this is how occupations are actually perceived. The sex domination of occupations in this study was established by the number of each sex reported to be in the occupation by the 1986 census. The ratio male : female in many occupations is likely to have changed somewhat over the years; however an important additional factor is the respondents' perception as to the dominant sex, if any, of the occupation. Future studies should, at the very least, measure this in a pilot study, or measure it some time after the original study has been conducted using the same respondents. In this way the data cannot be contaminated by drawing respondents' attention to the sex domination of the occupations at the time of the study.

On a similar note, a study that uses differing job titles for the same job, such as nurse aid and medical assistant, could also give some insight into the attitudes of the respondents.

The final suggestion is in relation to the type of measure used. This study used a direct method of assessing the utility of occupations. It might also be worthwhile to use a multi- attribute method such as that used by Keeney (1977) and Pitz, Heerboth and Sachs (1980). This would allow occupations to be valued considering their job components such as skill, responsibility and training. The results of this type of multi- attribute study would be more comparable to the results from job evaluations which are widely used by organisations and those trying to assess comparable worth.

5.5 CONCLUSION

The power function obtained predicted values based on income for each occupation which allow a comparison to be made between the estimated and predicted values. This comparison indicates which occupations are underpaid according to the value estimated, or alternatively, those occupations which are under-valued. The overall findings suggest that occupations have differing values to society, but this has less to do with the dominant sex of the occupation, individuals' basic knowledge of the occupations or the sex of the respondent, than it has to do with the income earned in an occupation.

There are problems in using this study as a measure of pay equity which can be solved by expanding the study and incorporating more controls. With these adjustments, the technique of magnitude estimation and the power law could be useful as a part of a wider pay equity study establishing general attitudes to different occupations.

REFERENCES

Aldrich, M. and Buchele, R. (1986). *The Economics of Comparable Worth.* Massachusetts : Ballinger.

Belcher, D.W. (1974). *Compensation Administration.* New Jersey : Prentice-Hall.

Atchinson, T.J. (1984). Compensation administration. In A.F. Sikula and J.F. McKenna. *The Management of Human Resources : Personnel Text and Current Issues.* New York : Wiley.

Bellace, J. R. (1987). The impact of the American and British equal pay guarantee on job evaluation. *Applied Psychology : An International review, 36* (1), 9 - 24.

Boudreau, J.W. (1983). Economic considerations in estimating the utility of human resource productivity improvement programs. *Personnel Psychology, 36* , 551 - 576.

Burns, J. (1989). *Job Evaluation.* Wellington : Equal Employment Opportunities Unit, State Services Commission..

Cascio, W. F. (1987). *Applied Psychology in Personnel Management.* New York : Prentice- Hall.

Cascio, W.F. and Silbey, V. (1979). Utility of the assessment centre as a selection device. *Journal of Applied Psychology, 64* (2), 107 - 118.

Coleman, B.J. Graf, R.G., and Alf, E.F. (1981). Assessing power function relationships in magnitude estimation. *Perception and Psychophysics, 29* (2), 178 - 180.

Coleman, R.P. and Rainwater, L. (1978). *Social Standing in America.* New York : Basic Books.

Cross, D. V. (1982). On judgements of magnitude estimation. In B. Wegner (Ed.). *Social Attitudes and Psychophysical Measurement.* New Jersey : Lawrence Erlbaum Ass.

Elley, W. B. and Irving, J.C. (1985). The Elley - Irving socio- economic index 1981 census revision. *New Zealand Journal of Educational Studies, 20* (2), 115 - 128.

Galanter, E. (1962). The direct measurement of utility and subjective probability. *American Journal of Psychology, 75* , 208 - 220.

Hamblin, R.L. (1974). Social attitudes : magnitude measurement and theory. In H. M. Blalock (Ed.). *Measurement in the Social Sciences : Theories and Strategies.* London: Macmillan.

Hays Lowe, R. and Andrisin Wittig, M. (1989) Comparable worth : individual, interpersonal, and structural considerations. *Journal of Social Issues, 45* (4), 223 - 246.

Hegtvedt, K.A. (1989). Fairness conceptualizations and comparable worth. *Journal of Social Issues, 45* (4), 81 - 97.

Hollenbeck, J.R. and Ilgen, D.R. Ostroff, C. and Vancouver, J.B. (1987). Sex differences in occupational choice, pay and worth : a supply-side approach to understanding the male- female wage gap. *Personnel Psychology, 40* , 715 - 743.

Hutner, F. C. (1986). *Equal Pay for Comparable Worth : The Working Women's Issue of the Eighties.* New York : Praeger.

Hyman, P. (1981). Women and pay. *New Zealand Journal of Industrial Relations, 6.* 79 - 89.

Hyman, P. (1985). Implementing equal pay for work of equal value. *National Business Review,* Dec. 9, 16.

Hyman, P. (1986). A step further : equal pay for work of equal value. *National Business Review,* Dec. 9, 16.

Hyman, P. (1987). *The Fight for Equal Pay for Work of Equal Value . (Comparable Worth) in New Zealand : Lessons from past campaigns in New Zealand and elsewhere.* Paper for Seventh Berkshire Conference on the History of Women, Wellesley College, Wellesley, Massachusetts.

Hyman, P. and Clark, A. (1987). Equal Pay Study : Phase One Report. Wellington : Urban Research Associates, Department of Labour.

Irving, J.C. and Elley, W.B. (1977). A socio-economic index for the female labour force in New Zealand. *New Zealand Journal of Educational Studies, 12* (2), 154 - 163.

Kemp, S. (1988). Magnitude estimation of the utility of nonmonetary items. *Bulletin of the Psychonomic Society, 26* (6), 544 - 547.

Kemp, S. (1989). *Magnitude Estimation of the Utility of Public Goods.* Unpublished manuscript, University of Canterbury, Psychology Department, Christchurch.

Landy, F.J., Farr, J.L., and Jacobs, R.R. (1982). Utility concepts in performance measurement. *Organisational Behaviour and Human Performance, 30* , 15 - 40.

Lee, R and Booth, J.M. (1974). A utility analysis of a weighted application blank. *Journal of Applied Psychology, 59* (4), 516 - 518.

Major, B. (1989). Gender differences in comparisons and entitlement : implications for comparable worth. *Journal of Social Issues, 45* (4), 99 - 115.

Mosteller, F. and Nogee, P. (1951). An experimental measurement of utility. *Journal of Political Behaviour, 51* (2), 371 - 401.

Mount, M.K. and Ellis, R. A. (1987). Investigation of bias in job evaluation ratings of comparable worth study participants. *Personnel Psychology, 40*, 85 - 95.

New Zealand Business Roundtable. (1988). *Employment Equity : Issues of Competition and Regulation, November.* Wellington.

New Zealand Standard Classification of Occupations : Manual. (1976). Wellington : Department of Labour.

O'Neill, J. E. (1987). Discrimination and income inequality. In E.F. Paul, F.D. Miller, J. Paul, and J. Ahrens. (Eds.) *Equal Opportunity.* Oxford : Basil Blackwell.

Pitz, G.F. Heerboth, J., and Sachs, N.J. (1980). Assessing the utility of multiattribute utility assessments. *Organisational Behaviour and Human Performance, 26,* 65 - 80.

Rudman, R. (1989). Pay equity forces re-evaluation of employees worth. *Management, February,* 51 - 55.

Schwab, D. P. and Grams, R. (1985). Sex-related errors in job evaluation : a "real- world" test. *Journal of Applied Psychology, 70* (3), 533 - 539.

Shimmin, S. (1987). Job evaluation and equal pay for work of equal value. *Applied Psychology : An International Review, 36* , 61 - 70.

Shinar, E. H. (1975). Sexual stereotypes of occupations. *Journal of Vocational Behaviour, 7,* 99 - 111.

Stevens, S.S. (1957). On the psychophysical law. *Psychological Review, 64,* 153 - 181.

Stevens, S. S. (1959). Measurement, psychophysics and utility. In C.W. Churchman and P. Ratoosh. (Eds.) *Measurement : Definitions and Theories.* Wiley : New York.

Stevens, S.S. (1975). *Psychophysics : Introduction to its Perceptual, Neural, and Social Prospects.* Wiley : New York.

Szakats, A. (Ed.) (1990, February). Legislation before the house. *Mazengarb's Industrial Law Bulletin : Recent Developments in Industrial Law, Issue number 1,* 3 - 5.

Taylor, S.H. (1989). The case for comparable worth. *Journal of Social Issues,* 45 (4), 23 - 37.

Teghtsoonian, M. and Teghtsoonian, R. (1971). How repeatable are Stevens's power law exponents for individual subjects? *Perception and Psychophysics, 10* (3), 147 - 149.

Treiman, D. J. and Hartmann, H.I. (1981). *Women, Work, and Wages : Equal Pay for Jobs of Equal Value.* Washington : National Press.

Waluchow, W. (1988). Pay equity : equal value to whom? *Journal of Business Ethics, 7,* 185 - 189.

Wegner, B. (1982). Outline of a structural taxononomy of sensory and social psychophysics. In B. Wegner (Ed.). *Social Attitudes and Psychophysical Measurement.* New Jersey : Lawrence Erlbaum Ass. .

Wexley, K. N. and Yukl, G.A. (1984). *Organisational Behaviour and Personnel Psychology.* Illinois : Irwin.

White, M.J., Kruczek, T.A., Brown, M.T., and White, G.B. (1989). Occupational sex stereotypes among college students. *Journal of Vocational Behaviour, 34,* 289 - 298.

APPENDIX A

The questionnaire form with job descriptions

VALUE OF OCCUPATION QUESTIONNAIRE

This study is part of a Masters thesis by Tracey Bond at the University of Canterbury. It is concerned with the value of different occupations.

Please try to give a value to all the occupations listed by first reading the general job description then giving a value using the method as instructed.

Please indicate your age and sex by circling the appropriate group.

AGE: 15 - 25 26 - 35 36 - 45 46 - 55 56 - 65 66 and over

SEX : Male Female

Please state your occupation.

.....

INSTRUCTIONS

Following is a list of occupations and a brief job description for each. Please make an estimate of what you feel is the value of these occupations to society.

Please disregard the income earned by members of particular occupations. Instead, rate the occupations according to how much you feel someone practicing it contributes to society as a whole.

Estimate the value of each occupation relative to the *standard*.

The standard is a Secondary School Teacher who contributes 100 units of value.

A secondary school teacher instructs pupils in a Secondary School. They prepare annual programmes of work within the limitations of a specified curriculum; gives instruction, conducts discussions, supervisors written work and maintains discipline in class; sets practice exercises, tests and examinations and marks pupils work; keeps pupil records and reports on their progress to head teacher and parents.

If you feel an occupation is ***five*** times more valuable to society as a Secondary School Teacher then assign it a value of 500 units (5 x 100).

If you feel an occupation is ***half*** as valuable to society then assign it 50 units, and so on.

Feel free to use fractions or decimals if you like.

There are no "correct answers"; only consider the value you personally feel the occupation has for society.

Occupation *Response*

Hotel Porter

Performs a variety of tasks for hotel guests, especially at arrival and departure. Controls issues and returns of hotel guest-room keys; receives and distributes mail, telegrams and packages or instructs bell-boy to deliver them to guest rooms; supplies information about entertainment, restaurants, transportation and other matters.

.....*units*

Bus Driver

Drives motor bus or motor coach to transport local or long-distance passengers :
Drives bus over predetermined route, with due regard to other traffic, traffic regulations, signals from conductor and time schedules.

.....*units*

Painter

Applies coats of paint and similar materials to exterior and interior surfaces of buildings to protect and decorate them: Mixes paint according to colour and other characteristics; erects scaffolding or positions ladder; removes old paint; cleans surface and patches cracks and holes; applies undercoat and one or more coats of paint.

.....*units*

Plumber

Assembles, installs and maintains pipes, fittings and fixtures of drainage, heating, water supply and sanitary systems: Examines drawings and other specifications to locate and position pipes and pipe connections; tests for leaks of air and water pressure gauges; installs assemblies and fixtures; does repair and maintenance work.

.....*units*

Restaurant Manager

Plans, co-ordinates and supervises activities of workers in dining-rooms, kitchen, bar and other areas; hires, instructs and discharges staff as necessary; purchases food and confers with chef to plan menus; organises and supervises arrangements for special functions; plans entertainers; adjusts complaints concerning food and service; keeps cost and other records.

.....*units*

Waiter/Waitress

Prepares tables or counters for meals; hands menu to customer, answers questions about food and beverages and makes suggestions if required; writes order on check or memorises it and orders food from kitchen; serves food; presents bill for payment or for signature by customer.

.....*units*

Hostel Manager

Plans, directs and controls the organisation, administration and operation of departments, such as accounting, housekeeping, catering, purchasing and maintenance; establishes and maintains standards of personnel performance and services to boarders; authorises expenditure, allocates funds and plans budgets for all departments.

.....*units*

Physiotherapist

Treats sprains, healing fractures, paralysis, circulatory and nervous disorders by physical means, usually as described by a physician : Administers body massage and performs other body manipulations; gives treatment by infra-red or other rays; instructs patients in remedial exercises to correct muscle ailments and deficiencies.

.....*units*

Hospital Orderly

Performs simple tasks to assist nursing personnel in a hospital :

Bath, shaves and massages patients, measures and records intake and output of liquids; gives enemas; lifts patient on or off bed, and transports patients to different areas of the hospital; sets up equipment such as oxygen tents, portable X-ray machines, and overhead irrigation bottles.

.....*units*

Telephone Switchboard Operator

Observes switchboard for incoming calls; makes contact with caller and person called; makes connections for out-going calls; routes long-distance calls or gives necessary instructions to other switchboard operators; observes and records charges for long-distance or other calls.

.....*units*

University Lecturer

Conducts courses of instruction at a university; conducts classes, delivers lectures and instructs students; may teach in one or more courses; may specialise in any field; may deliver extramural lectures.

.....*units*

Lawyer

Pleads cases or conducts prosecutions in courts of justice.

Examines the circumstances of disputes or reported crimes to ascertain the facts; determining the applicable law; preparing pleadings or cases for prosecution and conducting them in court.

.....*units*

Kitchenhand

Keeps kitchen area clean; cleans dishes and cooking utensils; removes garbage; transfers supplies and equipment between storage and work areas; sets up banquet tables.
May wash and peel vegetables by hand or machine. May prepare other food for cooking. Usually works under a cook.

.....*units*

Veterinary

Diagnoses and gives or prescribes medical or surgical treatment of diseases, injuries or other medical conditions of animals, and assist in epidemiological, radiological and other surveillance of animal health.
They may advise on care and breeding of animals.

.....*units*

Occupational Therapist

Participates in planned medically orientated activities designed to rehabilitate physically or mentally disabled person Consults physiotherapists; helps patients to regain physical capacities or mental and emotional stability by occupying them in creative and manual arts; writes reports on patient's reactions to occupational therapy and progress made.

.....*units*

Accountant

Plans, installs and advises on accounting systems; assists in formulation of budget policies; prepares and certifies financial statements for presentation ; prepares or reviews tax returns and contests claims before tax officials; conducts financial investigations; audits accounting activities in individual establishment and plans and directs work of bookkeepers, cashiers and bookkeeping clerks.

.....*units*

Motor Vehicle Mechanic

Examines, dismantles, rebuilds and replaces defective mechanical parts; adjusting motors, brakes, steering and other parts of motor vehicles; servicing and repairing motor cycles; performing related tasks.

.....*units*

Builder

Consults client regarding work to be done, and drafts plans and specifications where necessary; executes or supervises directly all of the construction work, or arranges for work such as bricklaying, painting, plumbing and electrical wiring to be done by sub-contractors; performs tasks similar to those of a number of building trades craftspeople according to capacity.

.....*units*

Aircraft Steward/Stewardess

Renders personal service to ensure the comfort and safety of aircraft passengers :
Greets passengers and conducts to assigned seats; ensures that passenger seat belts are fastened and "no smoking" signs are obeyed; serves pre-prepared meals and beverages; administers minor medical aid as necessary and renders any other service contributing to passengers' comfort; explains use of safety equipment such as lifebelts and oxygen masks, and assists passengers in emergencies according to established safety procedures.

.....*units*

Police

Maintains law and order, protects persons and property from hazards and unlawful acts and arrests persons for contraventions of the law : keeps records, makes reports of activities and gives evidence in courts. May be designated according to type of duty performed, means of transportation, or type of area patrolled. May work in co-operation with Detective.

.....*units*

Prison Officer

Watches inmates of gaol; reformatory or penitentiary, sees to their needs and maintains discipline : Searches arriving prisoners and puts their valuables in safe keeping; escorts prisoners to cells and locks them in; makes periodic inspection tours of cells; supervises prisoners; patrols prison areas and walls to prevent escape. May serve meals to prisoners.

.....*unitt*

Accounts clerk

Maintains complete records of documents and records of financial transactions of an undertaking: Verifies accuracy of documents and records relating to payments, receipts and other financial transactions and makes necessary calculations; makes and checks entries in and totals ledgers; compiles reports to show receipts, payments, balances of accounts.

.....*units*

Hairdresser

Cuts, washes and dressing women's hair and performing other personal services incidental to hairdressing; cuts men's hair, shaves, trims and gives other related treatments.

.....*units*

Primary School Teacher

Teaches primary academic subjects and elementary principles of social behaviour to children. Prepares annual programme of work in reading, writing, arithmetic and other primary academic subjects; gives instruction, conducts discussion and supervisors work; sets practical exercises and tests and marks children's work; maintains discipline; keeps children's work performance, attendance and other records and reports on their academic progress and social adjustment to head teacher and parents.

.....*units*

Data-Processing Machine Operator

Operate automatic machines which classify, sort, calculate, summarise and record scientific, technical, business, or other data.

.....*units*

Traffic Officer

Maintains law and order amongst persons and vehicles using the streets and highways : Issues ticket or warns persons guilty of violating traffic regulations; directs activities in accident or disaster area, rendering first aid and restoring traffic to normal; investigates conditions and causes of accidents and reports road hazards to authorities; takes statements from violators and witnesses; arranges for ambulance and towtruck at accident scene; directs traffic in congested areas and serves as escort for parades and other vehicular hazards; keeps alert for stolen vehicles; gives breathalyser to persons suspected of drunken driving; attends court to give evidence in traffic cases; compiles and submits reports to superior.

.....*units*

Florist

Arranges and sells floral decorations, such as bouquets, cordages, sprays and wreaths: Suggests floral arrangements appropriate for customers' requirement, applying knowledge of social, religious and ethnic customs; assembles floral pieces; arranges floral displays; telegraphs or telephones other florists to place orders for out-of-town delivery.

.....*units*

Veterinarian Assistant

Carries out, but only to a limited extent, diagnostic, preventive and curative veterinary duties as described under Veterinarian, more particularly as regards common disorders and diseases of animals, either independently or under the general direction of fully qualified Veterinarian.

.....*units*

Librarian

Plans and supervisors the acquisition, classification, cataloguing, shelving and circulation of library material, and the maintenance of records concerning its issue and return and related matters; publicises library facilities; recommends appropriate sources of information to inquirers, compiles reference lists; supervises maintenance of books and other material and arranges repair or rebinding as necessary.

.....*units*

General clerk

A variety of clerical tasks depending on nature and size of office in which employed :

Examines incoming mail referred for attention and assembled information needed for preparation of reply; prepares and sends replies to correspondence received and initiates other routine correspondence; compiles summaries of transactions and other reports for information of management; files vouchers, receipts, letters and other documents; makes telephone calls to obtain or supply information.

.....*units*

School Principal

Determines school educational programme, within limitations set by education authorities; plans, organises and directs activities of teachers in school and co-ordinates teaching programme through meetings with staff; directs or personally executes administrative and clerical activities concerning pupil admissions, provision of supplies and equipment and other auxiliary services; establishes and maintains relationships with other organisations; maintains standards of pupil behaviour in school; discusses progress and problems of individual pupils with parents and teachers and recommends desirable action.

.....*units*

Carpenter

Cut, shape, assemble, erect and maintain various types of wooden structures and fittings, using hand and power tools. Their functions include :

Making, altering and repairing structural and other woodwork at work bench and on construction site.

.....*units*

Ambulance Driver

Drives ambulance to transport sick, injured or convalescent persons :

Assists with lifting of patient onto stretcher and into and out of ambulance; drives sick or injured persons to hospital or convalescents to destination using skill and knowledge to avoid sudden motions detrimental to patients; receives and transmits instructions, using radiotelephone equipment; maintains records, such as name and address of sick or injured person, time, and other pertinent information ; changes soiled linen on stretcher.

.....*units*

General Typist

Types letters, memoranda and similar matter from written drafts or recordings after determining layout in accordance with instructions or using own judgement; types on forms, bills, invoices, insurance policies or other documents and cuts stencils; checks typewritten work for correctness.

.....*units*

Airline Pilot

Carries out pre-flight check, operates controls to manoeuvre aircraft on land and in the air and to take off and land; observes guages, meters and other cockpit instruments during flight to aid in control of aircraft and to detect irregularities; uses navigational aids to direct the course of aircraft in flight; observes air traffic control and safety instructions; keeps flight log.

.....*units*

Administration Officer

Administers office services; analyses operating practises to improve administrative procedure, makes recommendations to management; maintains budgetary and inventory controls; evaluates suitability of building and office area; negotiates lease or purchase; develops and sketches office layout to reflect management requirements; supervises and co-ordinates activities of workers engaged in clerical and maintenance duties; interviews job applicants, conducts orientation of new employees and implements training program; reviews and answers correspondence.

.....*units*

Kindergarten Teacher

Plans, organises and conducts such activities as plays, discussions, story-telling, games, singing, dancing, drawing, painting and modelling to increase children's understanding of their physical and social environment, stimulate and develop their interests and aptitudes, develop their self-confidence, encourage them in self-expression, foster their co-operative social behaviour and promote their healthy physical development; trains children in cleanliness, obedience, patience, tolerance and other elements of social behaviour; evaluates and discusses children's progress with parents.

.....*units*

Registered Nurse

Provides professional nursing services. Their functions include :

Providing professional nursing care and advice in hospitals, clinics or other establishments providing care and treatment: Gives prescribed medicines and injections according to nursing techniques; observes records and reports to supervisor or physician, patient's condition, or reaction to drugs, treatment given and other significant factors; makes beds, bathes and feeds patients, and takes temperature reading, pulse rate and respiration count; applies compresses and provides hot water bottles and other comforts for patients; sterilises instruments and keeps consulting room tidy.

.....*units*

Mail Sorting Clerk

Sorts and dispatches mail according to distinction and performs associated duties :

opens incoming mail and sorts it for delivery to departments.

.....*units*

Receptionist

Receives people coming into an establishment, ascertains their wants and directs them accordingly :

Supplies information or announces arrival and directs visitor to person called upon; deals with telephone calls requesting information or appointments; keeps records of callers.

.....*units*

Hospital Aid/ Nurse Aid

Performs simple tasks to assist nursing personnel, physicians or dentists in a consulting room, clinic, hospital or other institution providing medical or dental care :

Prepares patients for examination or treatment, holds instruments and adjusts lights and other equipment; bathes, dresses and undresses and otherwise assists patients as required; changes bed linen, applies compresses and provides hot water bottles and other comforts for patients needing help; sterilises instruments and keeps consulting room tidy.

.....*units*

Hospital Doctor

Examines patient and makes or arranges for X-ray examinations or special tests if further information is required; considers results of examinations and tests, consults specialists or other physicians as necessary and diagnoses nature of disorder; prescribes medicines, advises patients on regimen necessary to preserve or restore health; administers drugs as required; keeps records of patients examined, their disorders and the treatment given or prescribed.

.....*units*

Secretary - Typist

Schedules appointments, gives information to callers, takes dictation and relieves employer of clerical work and minor administrative and business details.

.....*units*

School Dental Nurse

Performs limited diagnostic, preventive and curative duties in dentistry for pre-school and schoolchildren under the direction and control of a dentist :

Carries out periodic examinations and treatment of schoolchildren; examines patients and charts dental conditions; places fillings; extracts teeth under local anaesthesia; refers the patient to a dentist; gives special attention to teaching the principles of oral hygiene and the prevention of dental disease.

.....*units*

Social Worker

Supervises and provides social services to meet the needs of persons in a community. Help individuals and families with their personal and social problems; organise and supervise social, recreational and educational activities; work to prevent development of juvenile and adult delinquents; help the mentally ill to submit and respond to psychiatric treatment and to cope with their personal and social problems; prevent cruelty to children; help the physically handicapped to adjust to their disabilities; plan and organise home-help services.

.....*units*

Bank Teller

Deals directly with clients of a bank in respect of deposits and withdrawals and related matters : Checks and completes deposit and withdrawal slips presented by clients, examines cheques and verifies customer's credentials; makes appropriate entries in customer's account book or on documents to be transferred to accounts section; usually receives and pays out cash and checks balance against transactions at end of day.

.....*units*

Dentist and Dental Surgeon

Performs diagnostic, preventive and curative services for dental or oral diseases and disorders : performs other duties such as advising patients on oral hygiene, organising oral health services and advising on public oral health questions.

.....*units*

Drainlayer

Lays tile drainpipe used in draining areas; cuts tile to fit special locations; adjusts pipe to line and grade specifications to provide fall for drainage. Directs workers engaged in shovelling.

.....*units*

Milk Vendor

Sells and distributes milk and cream to customers :

Loads truck or cart with milk and cream, drives truck or pushes cart over established route, picks up empty bottles and replaces with required number of full bottles and collects payment. May also sell fruit juices and flavoured milk.

.....*units*

Judge

Presides over judicial proceedings and pronounces judgements in courts of law :

Listens to presentation of pleadings or cases for prosecution and rules on admissibility of evidence, methods of conducting testimony and other matters of procedure; establishes rules of procedure on questions for which for which no standard procedure already exists; inquiries into and weights evidence presented by the parties and determines rights and obligations of parties in light of facts established or summarises facts of case for jury, instructs them on relevant points of law and directs them to reach a decision; pronounces judgement in light of own findings or those of jury.

.....*units*

Shop Assistant

Ascertains nature and quality of product required; assists customer in choice by demonstrating and describing characteristics of products available; packs and arranges delivery of purchases where necessary; replenishes goods on display.

.....*units*

Member of Parliament

Presides over, or takes part in activities of the state government legislative body or administrative council as an elected or appointed member :

Takes part in formulating government policy and in making, amending or repealing laws, ordinances and official regulations; serves on government administrative boards; investigates matters of concern to general public, and introduces proposals for remedial government action or otherwise endeavours to serve public or electoral interests.

.....*units*

Secondary School Teacher

Instructs pupils in a Secondary School. They prepare annual programmes of work within the limitations of a specified curriculum; gives instruction, conducts discussions, supervisors written work and maintains discipline in class; sets practice exercises, tests and examinations and marks pupils work; keeps pupil records and reports on their progress to head teacher and parents.

.....*units*

Sewing Machinist

Operates standard or specialised single- or multiple-needle sewing machine in making, repairing or renovating garments, gloves and miscellaneous products in textiles and kindred materials : Places bobbins of thread on machine; passes thread through machine guides and eye(s); adjusts machine according to sewing work to be done; guides material under needle(s) and removes it when sewing is completed; replaces empty bobbins and damaged needles.

.....*units*

Fireperson

Fights fires as a member of a public fire-fighting force : Rides on special fire-fighting vehicle or boat to scene of fire; connects hose and directs jet of water or chemicals on fire, or uses portable fire-extinguisher in places not accessible with hose; demolishes parts of buildings or other structures as necessary, to reach and combat fire; rescues trapped persons and administers artificial respiration to those overcome by smoke or heat; performs other services during emergencies, using specialised equipment where necessary.

.....*units*

Electrician

Installs, maintains and repairs electrical wiring and related equipment in buildings and other structures : Examines drawings and other specifications; positions and fixes wiring; connects wiring to source of electricity supply, tests for defects and makes necessary adjustments; replaces or repairs defective wiring and related equipment.

.....*units*

Cook

Prepares, seasons and cooks soups, meats, vegetables, desserts and other foodstuffs for consumption; supervises preparation of foodstuffs for cooking or eating raw; supervises cleaning up and dishwashing in kitchen.

.....*units*

Bartender

Serves alcoholic and non-alcoholic drinks at the bar :

Mixes various ingredients to make standard or special types of drinks according to orders; serves drinks.

.....*units*

APPENDIX B

The questionnaire form without job descriptions

VALUE OF OCCUPATION QUESTIONNAIRE

This study is part of a Masters thesis by Tracey Bond at the University of Canterbury. It is concerned with the value of different occupations.

Please try to give a value to all the occupations listed by using the method as instructed.

Please indicate your age and sex by circling the appropriate group.

AGE : 15 - 25 26 - 35 36 - 45 46 - 55 56 - 65 66 and over

SEX : Male Female

Please state your occupation.

.....

INSTRUCTIONS

Following is a list of occupations. Please make an estimate of the what you feel is the value of these occupations to society.

Please disregard the income earned by members of particular occupations. Instead, rate the occupations according to how much you feel someone practicing it contributes to society as a whole.

Estimate the value of each occupation relative to the *standard.*

The standard is a Secondary School Teacher who contributes 100 units of value.

If you feel an occupation is ***five*** times more valuable to society as a Secondary School Teacher then assign it a value of 500 units (5 x 100).

If you feel an occupation is ***half*** as valuable to society then assign it 50 units, and so on.

Feel free to use fractions or decimals if you like.

There are no "correct answers"; only consider the value you personally feel the occupation contributes to society.

Occupation	Response
Hotel Porter	units
Bus Driver	units
Painter	units
Plumber	units
Restaurant Manager	units
Waiter/Waitress	units
Hostel Manager	units
Physiotherapist	units
Hospital Orderly	units
Telephone Switchboard Operator	units
University Lecturer	units
Lawyer	units
Kitchenhand	units
Veterinary	units
Occupational Therapist	units
Accountant	units
Motor Vehicle Mechanic	units
Builder	units
Aircraft Steward/Stewardess	units
Police	units
Prison Officer	units
Accounts clerk	units
Hairdresser	units

Primary School Teacher	units
Data-Processing Machine Operator	units
Traffic Officer	units
Florist	units
Veterinarian Assistant	units
Librarian	units
General clerk	units
School Principal	units
Carpenter	units
Ambulance Driver	units
General Typist	units
Airline Pilot	units
Administration Officer	units
Kindergarten Teacher	units
Registered Nurse	units
Mail Sorting Clerk	units
Receptionist	units
Hospital Aid/ Nurse Aid	units
Hospital Doctor	units
Secretary - Typist	units
School Dental Nurse	units
Social Worker	units
Bank Teller	units
Dentist and Dental Surgeon	units

Drainlayer	units
Milk Vender	units
Judge	units
Shop Assistant	units
Member of Parliament	units
Secondary School Teacher	units
Sewing Machinist	units
Fireperson	units
Electrician	units
Cook	units
Bartender	units

APPENDIX C

The dominant sex of each occupation and the percentage of male and female job incumbents in each occupation

Occupation	Dominant Sex	% Male	% Female
Hotel Porter	male	82	18
Bus Driver	male	86	14
Painter	male	97	3
Plumber	male	99	1
Restaurant Manager	neutral	52	48
Waiter/Waitress	female	11	89
Hostel Manager	female	38	62
Physiotherapist	female	24	76
Hospital Orderly	male	91	9
Telephone Operator	female	9	91
University Lecturer	male	80	20
Lawyer	male	85	15
Kitchenhand	female	20	80
Veterinary	male	85	15
Occupational Therapist	female	9	91
Accountant	male	77	23
Motor Vehicle Mechanic	male	99	1
Builder	male	100	0
Aircraft Steward/ess	female	35	65
Police	male	94	6
Prison Officer	male	94	6
Accounts clerk	female	19	81
Hairdresser	female	18	82
Primary School Teacher	female	28	72
Data-Processing Operator	female	15	85
Traffic Officer	male	92	8
Florist	female	11	89
Veterinarian Assistant	female	0	100
Librarian	female	15	85
General clerk	female	22	78
School Principal	male	80	20
Carpenter	male	99	1
Ambulance Driver	male	95	5
General Typist	female	1	99

Airline Pilot	male	98	2
Administration Officer	neutral	48	52
Kindergarten Teacher	female	2	98
Registered Nurse	female	5	95
Mail Sorting Clerk	neutral	49	51
Receptionist	female	1	99
Hospital Aid/ Nurse Aid	female	8	92
Hospital Doctor	male	72	28
Secretary - Typist	female	2	98
School Dental Nurse	female	0	100
Social Worker	neutral	51	49
Bank Teller	female	16	84
Dentist and Dental Surgeon	male	96	4
Drainlayer	male	100	0
Milk Vender	male	91	9
Judge	male	96	4
Shop Assistant	female	27	73
Secondary School Teacher	neutral	55	45
Member of Parliament	male	85	15
Sewing Machinist	female	2	98
Fireperson	male	99.8	.02
Electrician	male	99.4	.06
Cook	female	28	72
Bartender	neutral	51	49